

SECTION1 SUMMARY

KEY TO ABBREVIATIONS

A	AC	:Alternating Current
	ACC	:Automatic Color Control
	ACSS	:Automatic Channel Setting System
	ADJ	:Adjust
	A/E	:Audio Erase
	AFC	:Automatic Frequency Control
	AFT	:Automatic Fine Tuning
	AGC	:Automatic Gain Control
	A.H.SW	:Audio Head Switch
	ALC	:Automatic Level Control
	AM	:Amplitude Modulation
	AMP	:Amplifier
	ANT	:Antenna
	APC	:Automatic Phase Control
	ASS'Y	:Assembly
	AUX	:Auxiliary
B	B	:Base
	BGP	:Burst Gate Pulse
	BPF	:Bandpass Filter
	BS	:Broadcasting Satellite
	BW or B/W	:Black and White
C	C	:Capacitor, Chroma, Collector
	CAN	:Cancel
	CAP	:Capstan
	CAP.BRK	:Capstan Brake
	CAP.RVS	:Capstan Reverse
	CATV	:Cable Television
	CBA	:Circuit Board Assembly
	CCD	:Charge Coupled Device
	C.CTL	:Chro Control, Capstan Control
	CFG	:Capstan Frequency Generator
	CHROMA	:Chrominance
	CNR	:Chroma Noise Redution
	COMB	:Combination
		Comb Filter
	COMP	:Comparator
		Composite
		Compensation
	CONV	:Converter
	C.ROT SW	:Color Rotary Switch
	CS	:Chip Selcet
	C.SYNC	:Composite Synchronization
	CTL DIV	:Control Divide
	CUR	:Current
	CYL	:Cylinder
D	D	:Drum, Digital, Diode, Drain
	D.ADJ	:Drum Adjust
	DC	:Direct Current
	D.CTL	:Drum Control
	DEMODO	:Demodulator
	DET	:Detector
	DEV	:Deviation
	DHP	:Double High Pass
	DIGITRON	:Digital Display Tube
	DL	:Delay line
	DOC	:Drop Out Compensator
	DUB	:Dubbing
	D.V SYNC	:Dummy Vertical Synchronization
	E	:Emitter
	EE	:Electric to Eletric
	EMPH	:Emphasis
E	ENA	:Enable
	ENV	:Envelope
	EP	:Extended Play
	EQ	:Equalizer
	EXP	:Expander
	F	:Fuse
	FB	:Feed Back
F	FBC	:Feed Back Clamp
	FE	:Full Erase
	FG	:Frequency Generator
	FL	:Filter
	FM	:Frequency Modulation
	F/R	:Front/Rear
	FS	:Frequency Synthesizer
	FSC	:Subcarrier Frequency
	F/V	:Frequency Voltage
G	GEN	:Generator
H	H	:High, Horizontal
I	IC	:Integrated Circuit
	IF	:Intermediate Frequency
	INS	:Insert
L	L	:Low, Left, Coil
	LD	:LED
	LD VTG CTL	:Loading Voltage Control
	LECHA	:Letter Character
	L.M	:Level Meter
	LP	:Long Play

	LPF	:Low Pass Filter
M	MAX	:Maximum
	MD	:Modulator
	MECHA.CTL	:Mechanism Control
	MIC	:Microphone
	MIN	:Minimum
	MIX	:Mixer, Mixing
	M.M.	:Monostable, Multivibrator
	MMV	:Mono Multi Vibrator
	MOD	:Modulation, Modulator
	MODEM	:Modulator-Demodulator
	MPX	:Multiplex
N	NR	:Noise Reduction
O	OSC	:Oscillator
	OSD	:On Screen Display
P	PB	:Playback
	PCB	:Printed Circuit Board
	P.CTL	:Power Control
	PRE-AMP	:Preamplifier
	P.F	:Power Failure
	PG	:Pulse Generator
	PLL	:Phase Locked Loop
	PREM.DET	:Premire Detect
	P.P	:Peak-to-Peak
	PS	:Phase Shift
	PWM	:Pulse Width Modulation
	PWR CTL	:Power Control
Q	Q	:Transistor
	QH	:Quasi Horizontal
	QSR	:Quick Setting Record
	QTR	:Quick Timer Record
	QV	:Quasi Vertical
R	R	:Resistor, Right
	RE(or RC)	:Remocon, Receiver
	REC	:Recording
	REC S 'H'	:Record Start 'High'
	REF	:Reference
	REG	:Regulated, Regulator
	REMOCON	:Remote Control(unit)
	RF	:Radio Frequency
	R/P	:Record/Playback
	RTC	:Reel Time Counter
S	S	:Serial
	S.ACCEL	:Slow Accel
	SAOP	:Second Audio Program
	SC	:Scart, Simulcast
	S.DET	:Secam Detect
	SH	:Shift
	SHARP	:Sharpness
	SIF	:Sound Intermediate Frequency
	SLD	:Side Locking
	S/N	:Signal to Noise Ratio
	SP	:Standard Play
	ST	:Stereo
	SUB	:Subtract, Subcarrier
	SW or S/W	:Switch
	SYNC	:Synchronization
	SYSCON	:System Control
T	T	:Coil
	TP	:Test Point
	TR	:Transistor
	TRK	:Tracking
	TRANS	:Transformer
	TU	:Tuner, Take-up
U	UHF	:Ultra High Frequency
	UNREG	:Unregulated
V	V	:Volt, Vertical
	VA	:Always Voltage
	VCO	:Voltage Controlled Oscillator
	VGC	:Voltage Gain Control
	VHF	:Very High Frequency
	V.H.SW	:Video Head Switch
	VISS	:VHS Index Search
	VPS	:Video Program System
	VR	:Variable Resistor or Volume
	V-SYNC	:Vertical Synchronization
	VTG	:Voltage
	VV	:Voltage to Voltage
	VXO	:Voltage X-tal Oscillator
W	W	:Watt
	WHT	:White
	W/O	:With out
X	X-TAL	:Crystal
Y	Y/C	:Luminance/Chrominance
	YNR	:Luminance Noise Reduction
Z	ZD	:Zener Diode

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, the products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

• Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.
2. Parts identified by the $\triangle$ symbol and shaded (∇) parts are critical for safety.
Replace only with specified part numbers.
Note : Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.
3. Use Specified internal wiring. Note especially:
 - 1) Double insulated wires
 - 2) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
 - 1) Insulation Tape
 - 2) PVC tubing
 - 3) Spacers
 - 4) Insulation sheets for transistor
5. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)
6. Check that replaced wires do not contact sharp edged or pointed parts.
7.
 - 1) When a power cord has been replaced, check that A mark is made on the cord, under strain, near the aperture, and the flexible cord is subjected 100 times to a pull of 40N for a duration of 1 second each.
 - 2) During the test, the cord shall not be displaced by more than 2mm
8. Also check areas surrounding repaired locations.

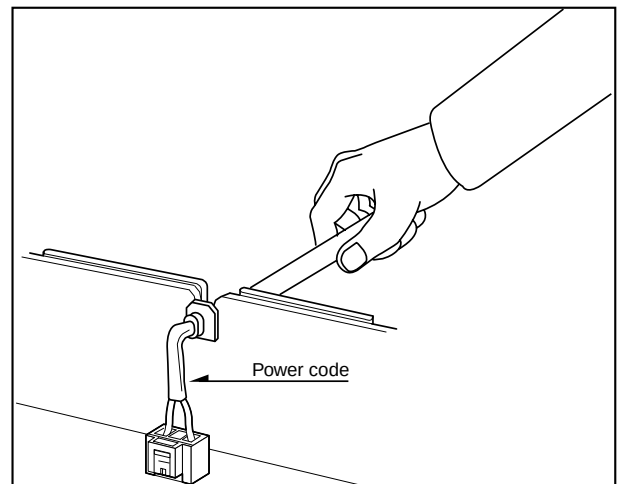


Fig. 1

SAFETY CHECK AFTER SERVICING

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

• Insulation resistance test

confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, incrophone jacks, earphone jacks, etc.) See table below.

• Dielectric strength test

Confirm specified dielectric strength or greater between power cord prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, incrophone jacks, earphone jacks, etc.) See table below.

• Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

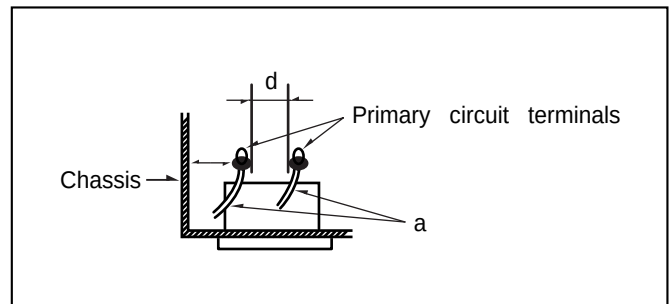


Fig. 2

Table 1 : Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance(d),(d')
*100 to 130 V 200 to 240 V	Europe Australia	F 10 MΩ/500 V DC	4kV 1 minute	F 6mm(d) F 8mm(d) (a Power cord)

* Class II model only.

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

• Leakage Current test

Confirm specified or lower leakage current between B(earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.)

Measuring Method: (Power ON)

Insert load Z between B(earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

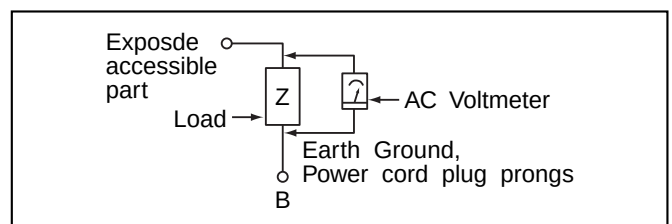


Fig. 3

Table 2:Leakage current ratings for selected areas.

AC Line Voltage	Region	Load Z	Leakage Current(i)	Earth Ground (B) to :
100 to 130 V	Europe	2kΩ	i E 0.7m A peak i E 2m A DC	Antenna earth terminals
200 to 240 V	Australia	50kΩ	i E 0.7m A peak i E 2m A DC	Other terminals

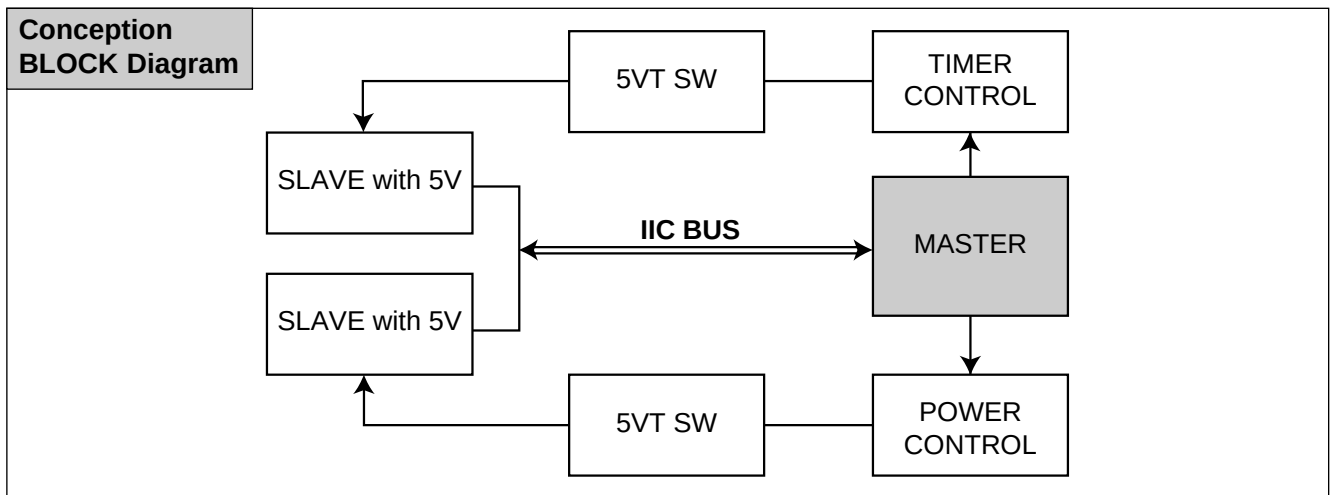
Note. This table is for IEC member only. Be sure to confirm the precise values for your particular country and locality.

PROPOSAL FOR APPLYING SHORT PROTECTION

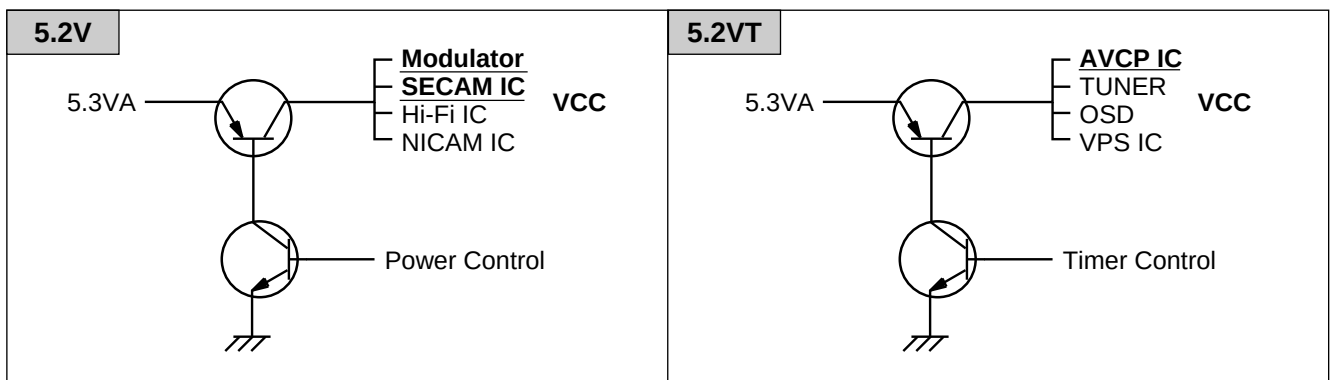
• The Contents of Examination

As all the IC that is applied to VCR is controlled by IIC, mutual communication, if Vcc of IC is short or open with detecting 'Acknowledge' data of the specific IC according to each power(5V, 5VT) μ -COM gets unable to detect 'ACK' data.

μ -COM regards this case as abnormal one and if it can't detect 'ACK' data for a certain time(3.5 sec) the signal of 'Power Control' and 'Timer Control' are switched to 'Low'. As a result POWER Switching TR is kept from generating heat and fire.



• POWER for each IC



• IC to detect 'ACK' data is selected as below because IC is different in accordance to region and option

S/	5V POWER	SECAM IC
Series	5VT POWER	AVCP IC
P/Y/I	5V POWER	Modulator
Series	5VT POWER	AVCP IC

*Short protection off mode : DJ01 Diode in

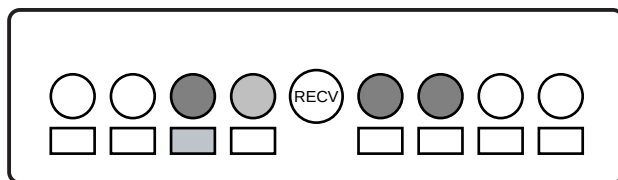
SERVICE NOTICE ON REPLACING EEPROM

In case that defective EEPROM of PAL models is replaced, to operate these sets from the initial state MP KEY must be repaired as well before delivering to the customer.

If MP KEY isn't repaired the setting of RF OUT channel or LANGUAGE might be different from that for customer's country.

- **MP KEY** : In case of PAL VCR if holding the REC button on the front panel and the CLEAR button on the remote control handset for 5 ~ 7 seconds with power being switch all and no tapes, OK is displayed at FLD for FLD models and LED becomes on for LED CLOCK models. This is the state that initializing EEPROM is finished.
(In case of PAL VCP if holding the REC button on the front panel and the MENU button on the remote control handset for 5 ~ 7 seconds with power being off and no tapes, All the LED DOTs become on. This is the state that initializing EEPROM is finished.)

- **MP KEY's function** : MP KEY sets EEPROM's data up to the initial state.

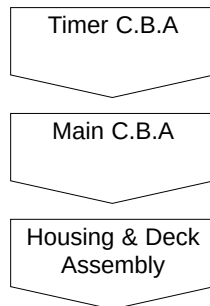


- **LED DOT MODEL:**
MP KEY Switch all on a Light

SECTION 2 CABINET & MAIN CHASSIS SERVICE METHOD

Electrical Part

(1) Re-assembly Flow for service like Fig. 2-1



(2) To check and replace Electrical parts

- ① Re-assemble the unit according to No.1) Re-assembly Flow.
- ② Place the unit like Fig. 2-1
- ③ Check and replace Electrical parts.

NOTE :

- ① Insert Video Cassette Tape inversely like Fig. 2-1 to check and replace defective parts.
- ② In disassembling and reassembling, be careful not to damaged CST switch.

(Positioned Upside Down)

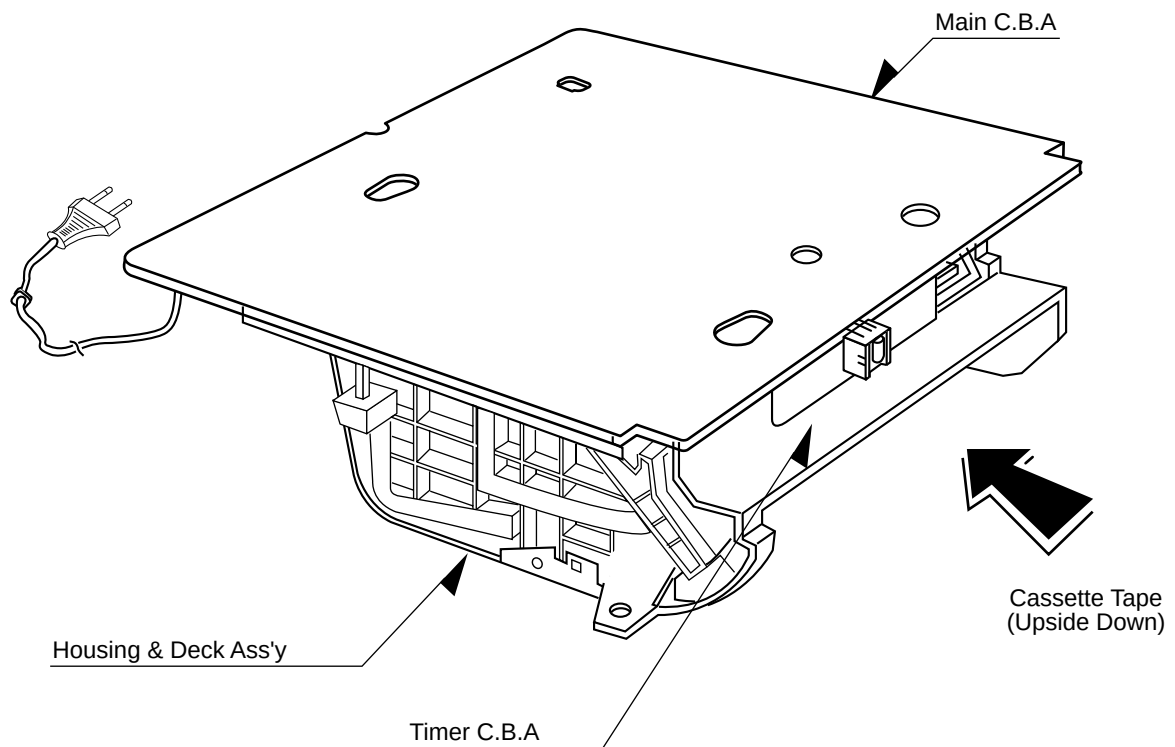
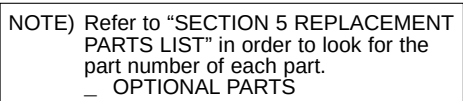


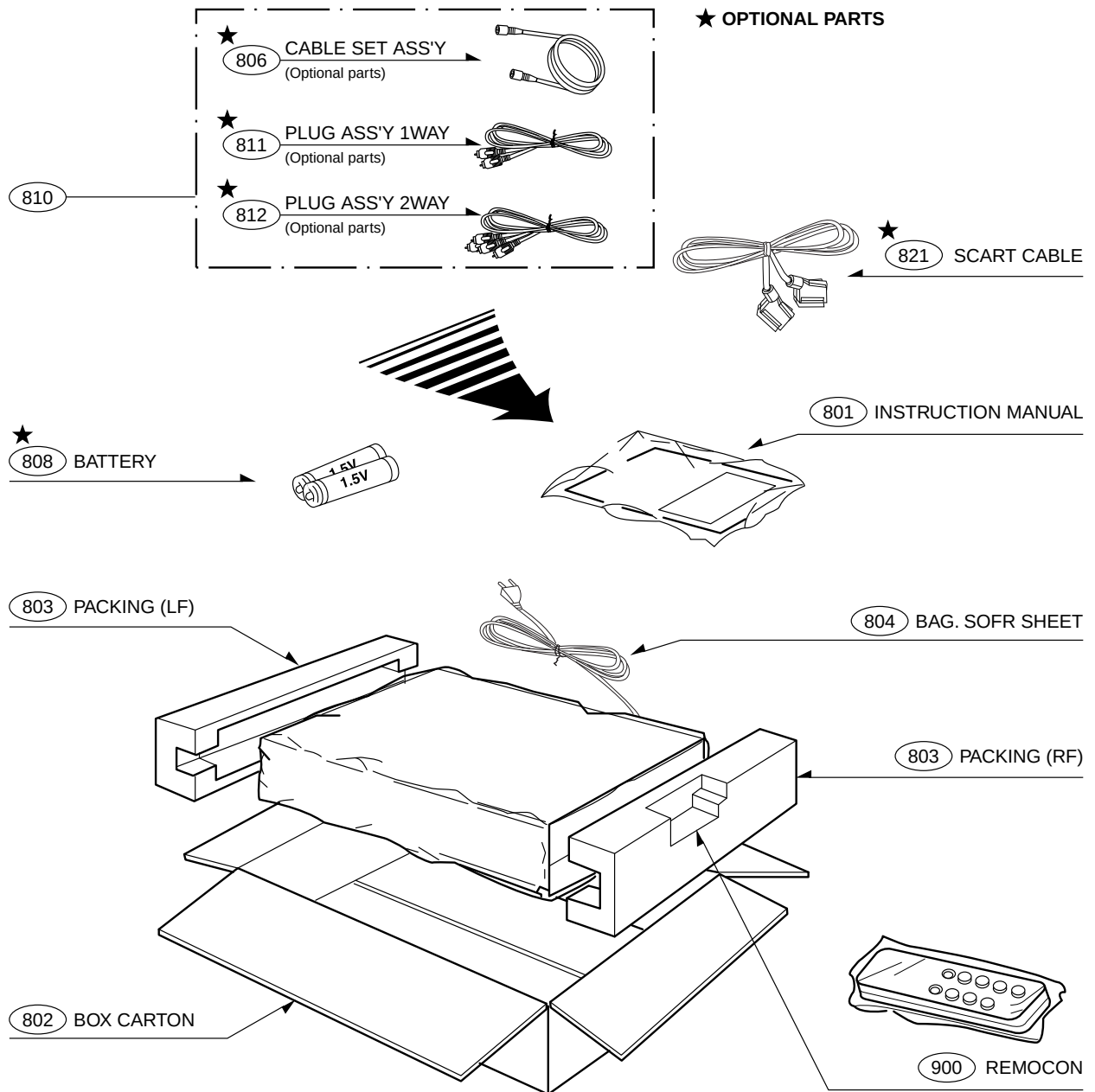
Fig.2-1

1. Cabinet and Main Frame Section



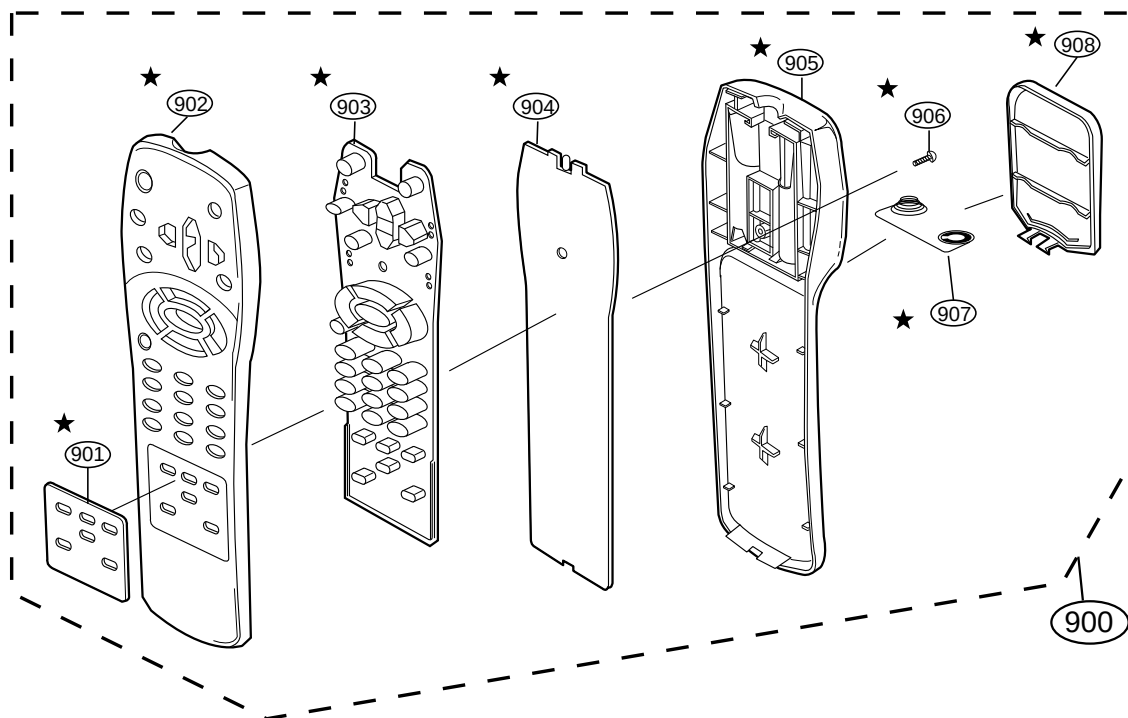
2.Packing Accessory Section

NOTE) Refer to "SECTION REPLACEMENT PARTS LIST" in order to look for the part number of each part.



3.Remote Control Section

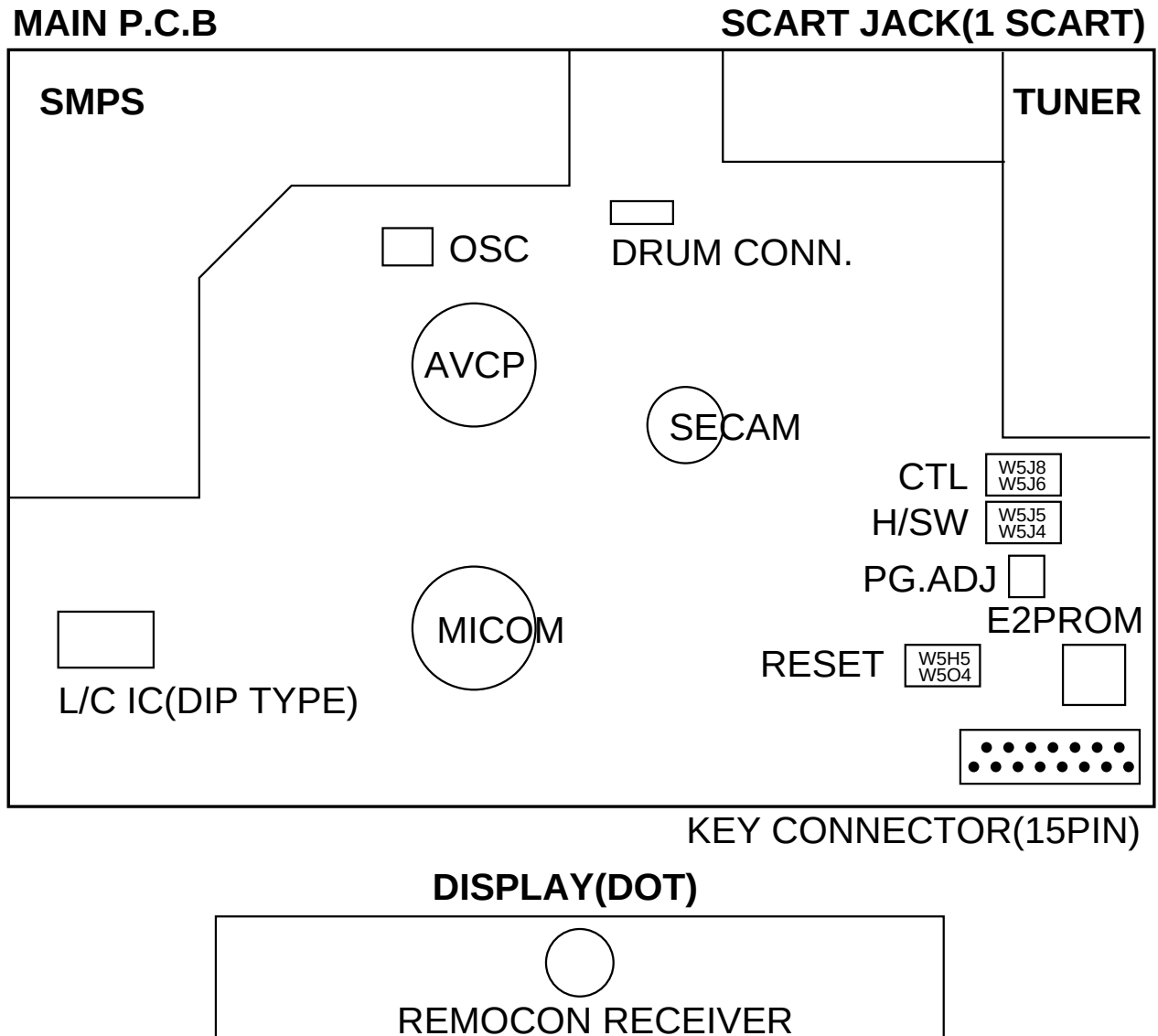
★ OPTIONAL PART



SECTION 3 ELECTRICAL

ELECTRICAL ADJUSTMENT POINTS ARRANGEMENT

○ : Measurement point
 □ : Adjustment point



ELECTRICAL ADJUSTMENT PROCEDURES

1. Servo Adjustment

- 1) PG Adjustment
 - Test Equipment

- a) OSCILLOSCOPE
- b) PAL TEST TAPE (VHS SP)

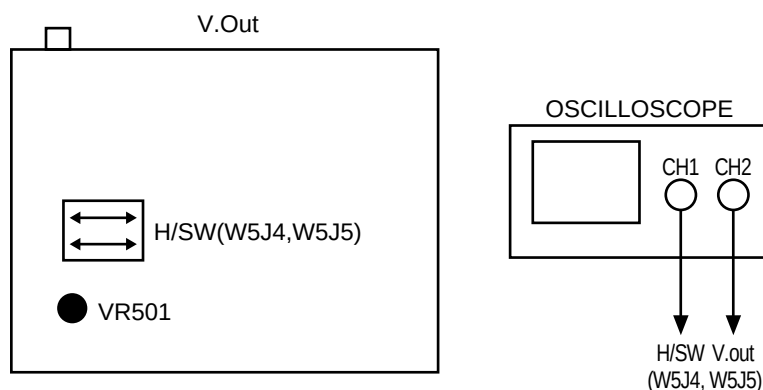
- Adjustment And Specification

MODE	MEASUREMENT POINT	ADJUSTMENT POINT	SPECIFICATION
PLAY	V.Out H/SW(W5J4, W5J5)	VR501	$6.5 \pm 0.5H$

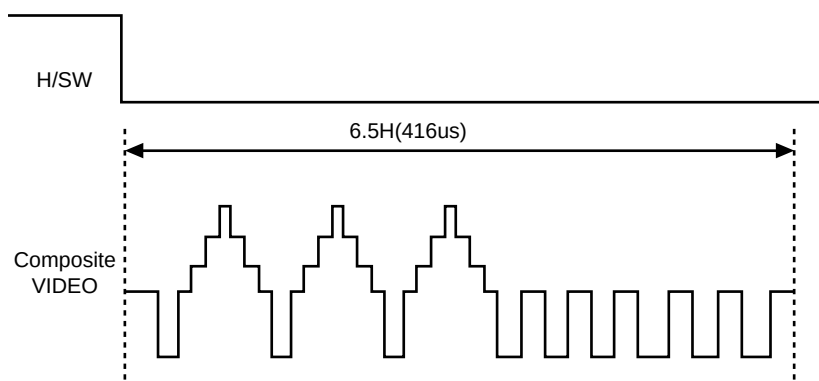
• Adjustment Procedure

- a) Insert the PAL SP Test Tape and play.
Note - Adjust the distance of X, pressing the Tracking(+) or Tracking(-) when the “ATR” is blink after the PAL SP Test Tape is inserted.
- b) Connect the CH1 of the oscilloscope to the H/SW(W5J4, W5J5) and CH2 to the Video Out for the VCR.
- c) Trigger the mixed Video Signal of CH2 to the CH1 H/SW(W5J4, W5J5), and then check the distance (time difference), which is from the selected A(B) Head point of the H/SW(W5J4, W5J5) signal to the starting point of the vertical synchronized signal, to $6.5H \pm 0.5H$ ($416\mu s$, $1H=64.0\mu s$).

• CONNECTION

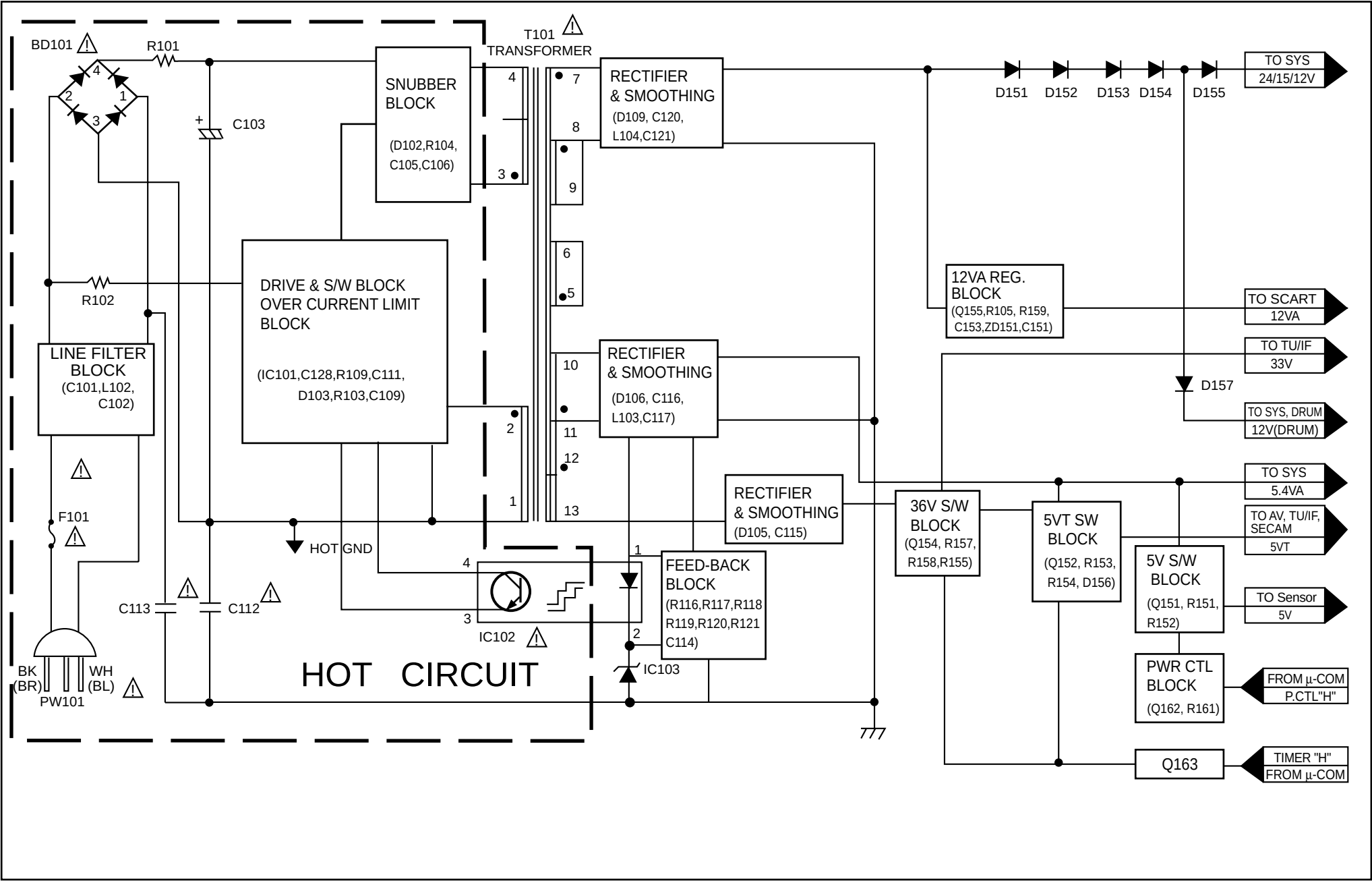


• WAVEFORM



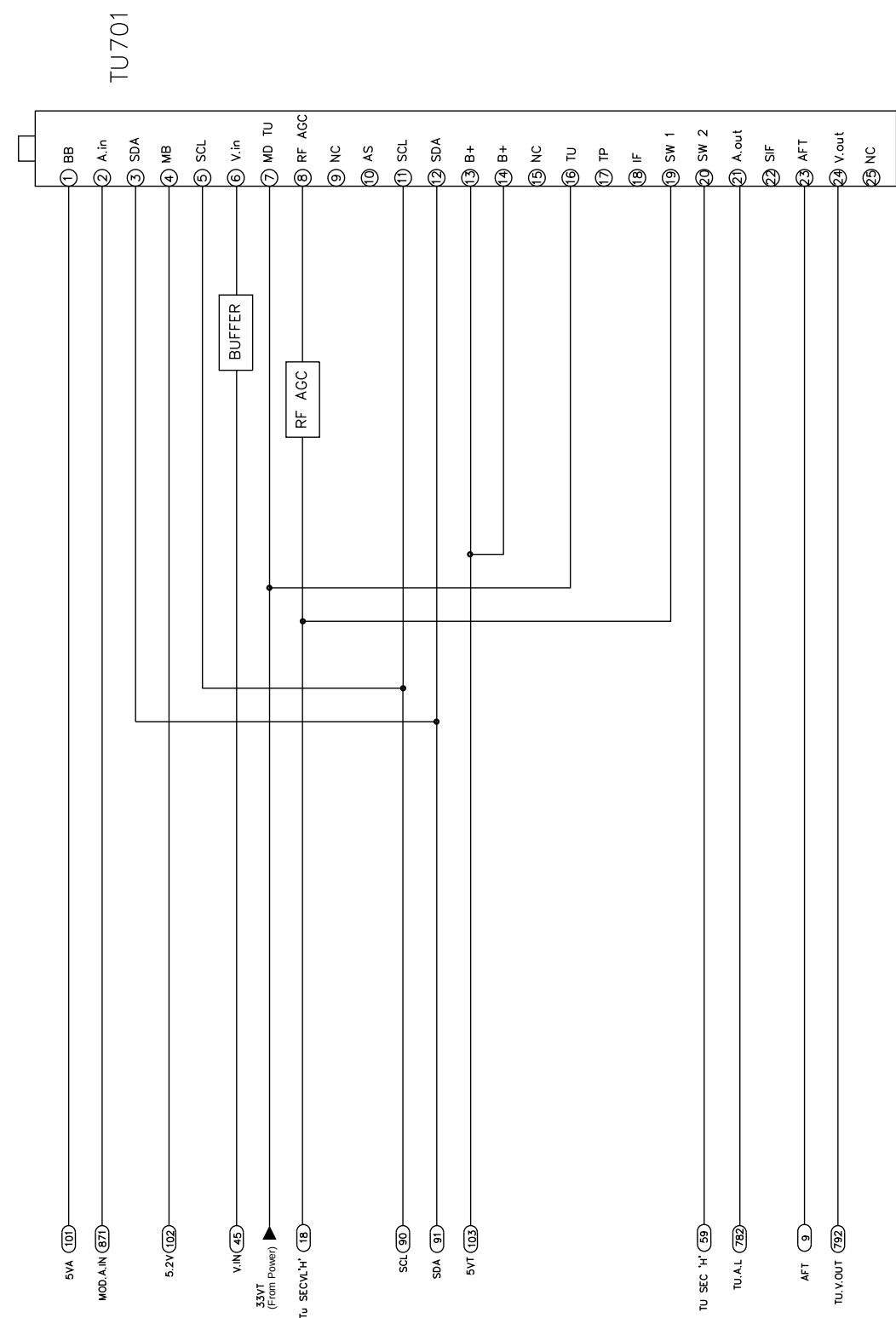
BLOCK DIAGRAMS

1. Power Block Diagram



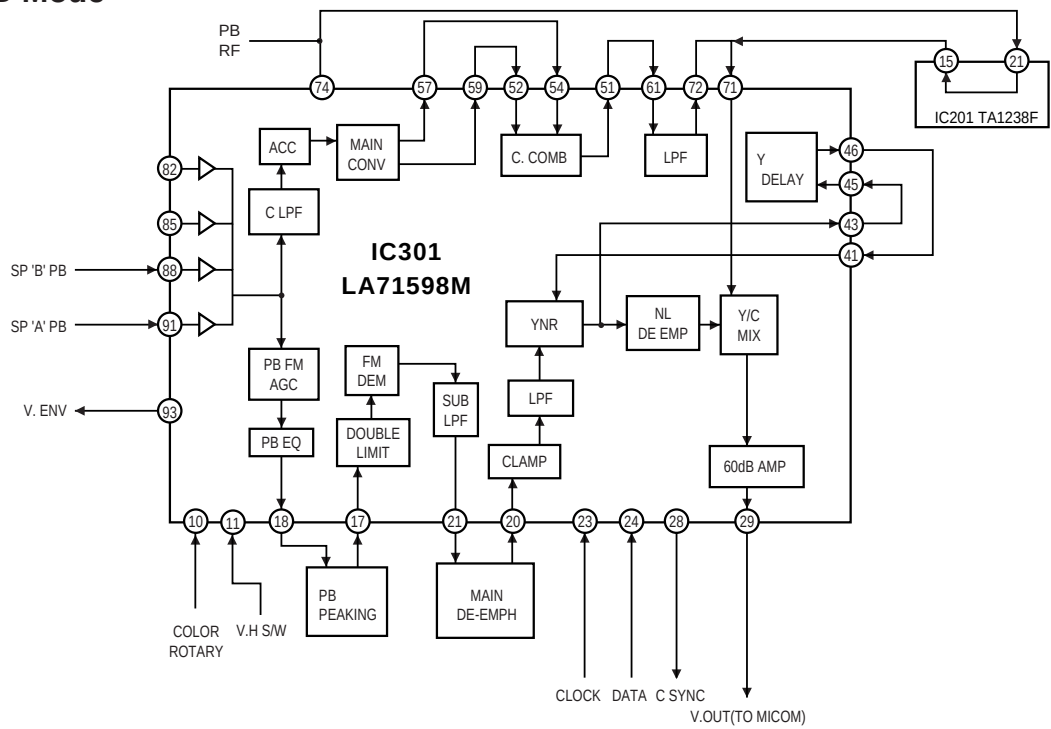
NOTES :  Symbol denotes AC ground.
 Symbol denotes DC chassis ground.

2. Tu/IF Block Diagram

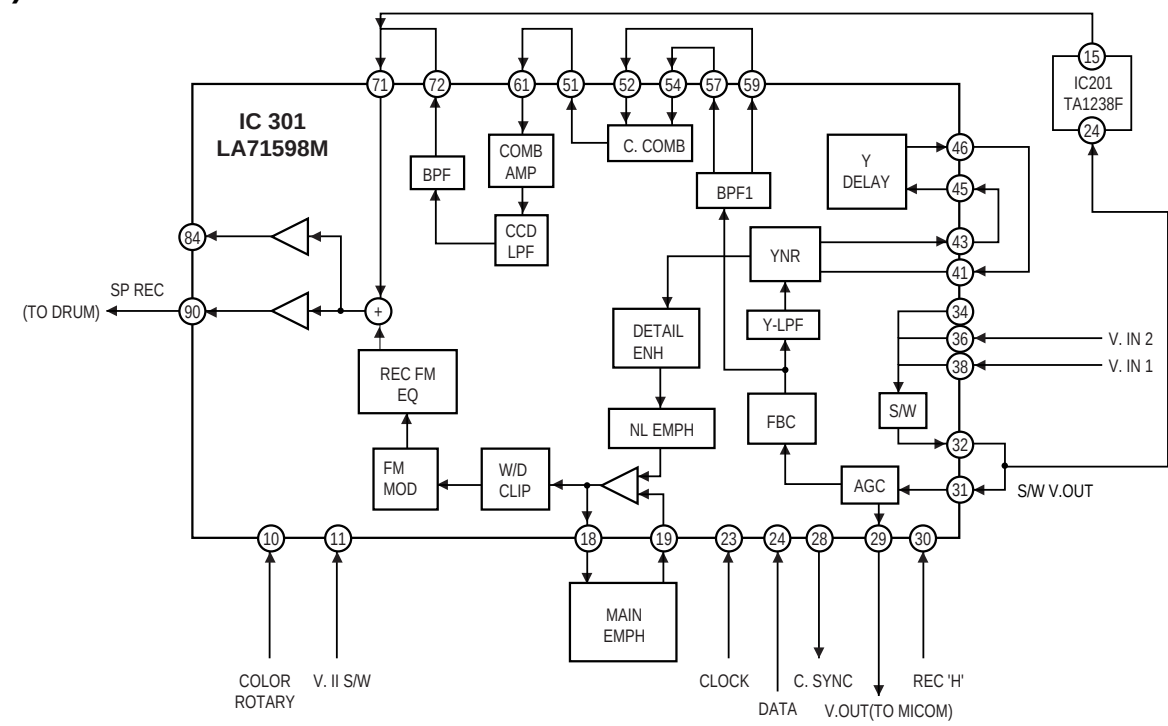


3. Y/C Block Diagram

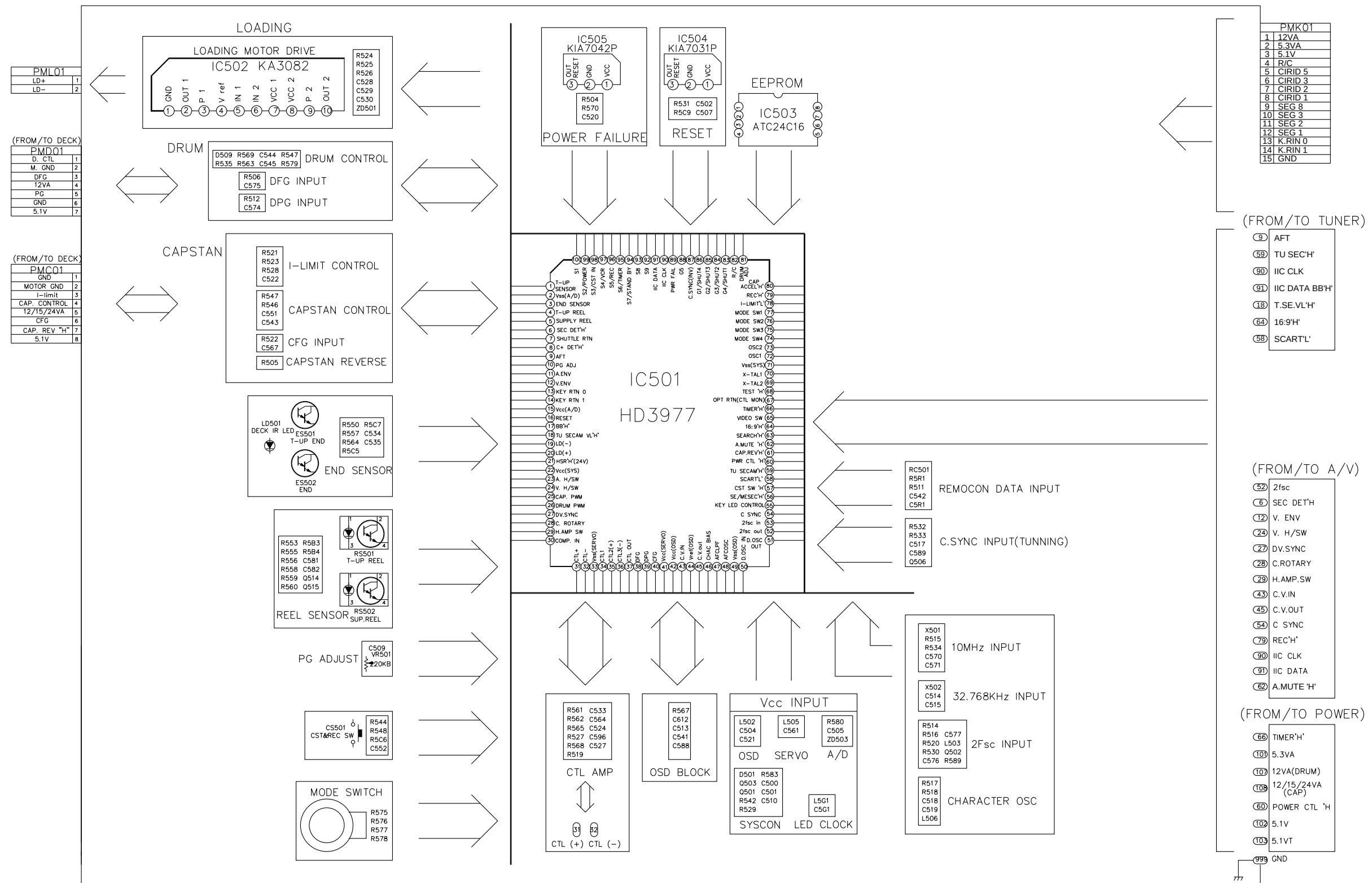
1) PB Mode



2) REC Mode

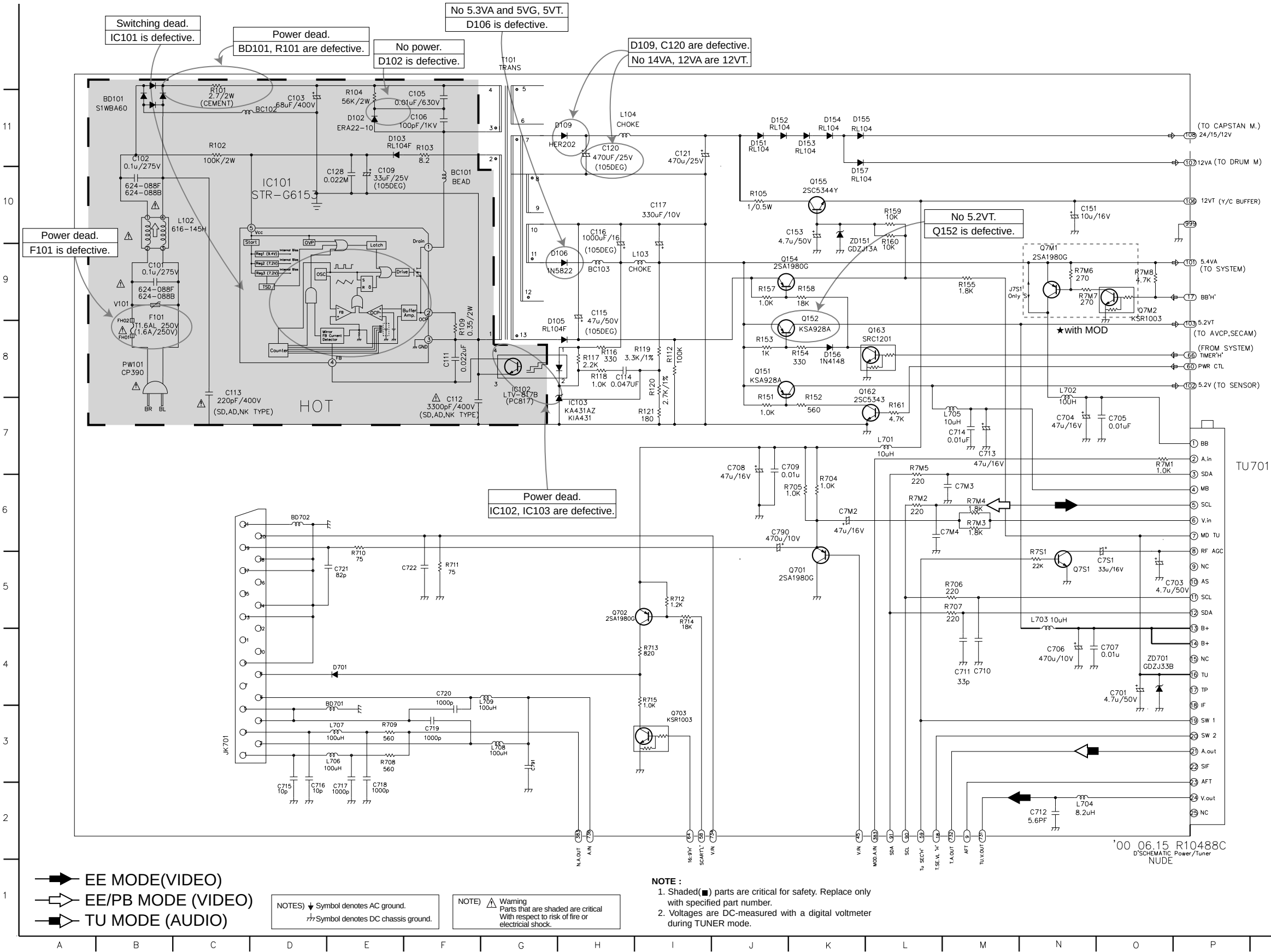


4. System Block Diagram



CIRCUIT DIAGRAMS

1. Power, Tuner, SCART Circuit Diagram



* IC101 Voltage Sheet * IC102 Voltage Sheet

PB	16.1	4.0
REC	16.3	4.6
5		
IC101		
1		
PB	309	0.0
REC	309	0.0

PB	4.0	0.0
REC	4.0	0.0
4		
IC102		
1		
PB	4.9	3.9
REC	4.9	4.0

LOCATION GUIDE

999	P10	D102	E11	R116	H8
BC101	F10	D103	E11	R117	H8
BC102	D11	D105	G8	R118	H8
BC103	H9	D106	G9	R119	H8
BD101	B11	D109	H11	R120	H8
BD701	E3	D151	J11	R121	I7
BD702	D6	D152	J11	R151	J7
C101	B9	D153	K11	R152	K7
C102	B11	D154	K11	R153	J8
C103	D11	D155	K11	R154	K8
C105	F11	D156	K8	R155	M9
C106	F11	D157	K10	R157	J9
C109	E10	D701	E4	R158	K9
C111	F8	FH01	B8	R159	L10
C112	F7	FH02	B8	R160	L9
C113	C8	IC101	D10	R161	L7
C114	H8	IC102	G8	R704	K6
C115	H9	IC103	H7	R705	J6
C116	H10	J751	M9	R706	M5
C117	I10	JK701	C3	R707	M5
C120	H11	L102	C10	R708	E3
C121	I11	L103	I9	R709	E3
C128	E10	L104	H11	R710	E5
C151	N10	L701	L7	R711	F5
C153	K10	L702	N8	R712	I5
C701	O4	L703	N5	R713	I4
C703	O5	L704	N2	R714	I5
C704	N7	L705	M7	R715	I4
C705	O7	L706	E3	R7M1	O7
C706	N4	L707	E3	R7M2	L6
C707	O4	L708	G3	R7M3	M6
C708	J7	L709	G4	R7M4	M6
C709	J7	FW101	B8	R7M5	L7
C710	M4	Q151	J8	R7M6	N9
C711	M4	Q152	K8	R7M7	N9
C712	N2	Q154	J9	R7M8	O9
C713	M7	Q155	K10	R751	N5
C714	M7	Q162	K8	T101	G12
C715	D2	Q163	L8	TU701	P7
C716	D2	Q701	K5	V101	B9
C717	E2	Q702	H5	ZD151	K10
C718	E2	Q703	I3	ZD701	O4
C719	F3	Q7M1	N9		
C720	F4	Q7M2	O9		
C721	E5	Q751	N5		
C722	F5	R101	C11		
C790	J6	R102	C11		
C791	G3	R103	F11		
C7M2	K6	R104	E11		
C7M3	M6	R105	J10		
C7M4	M6	R109	F8		
C7S1	O5	R112	I8		

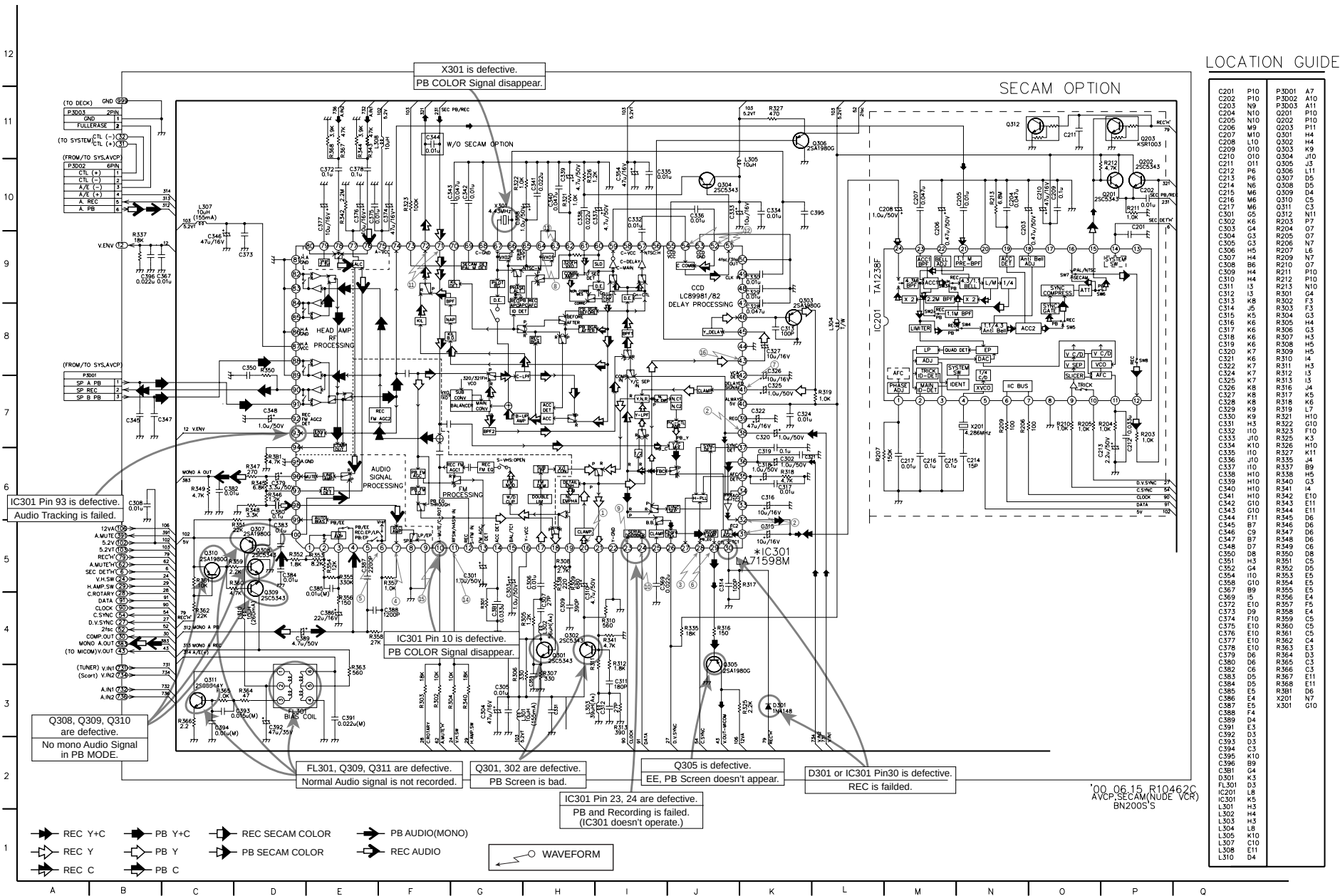
_ TR Voltage Sheet

	Emitter		Collector		Base	
	PB	REC	PB	REC	PB	REC
Q151	11.9	11.8	14.8	15.0	12.5	12.4
Q152	9.4	9.3	11.8	11.6	10.0	9.9
Q153	11.8	11.7	14.8	15.0	12.4	12.3
Q154	-27.3	-27.9	-27.3	-27.8	-26.6	-27.0
Q155	5.3	5.3	5.2	5.3	0.0	0.0
Q156	-16.1	-16.5	-16.0	-16.4	-15.4	-15.7
Q157	5.3	5.3	5.2	5.2	0.0	0.0
Q162	5.3	5.3	5.2	5.2	4.5	4.5
Q164	5.3	5.3	5.3	5.3	4.6	4.6
Q165	0.0	0.0	10.0	10.0	0.0	0.0

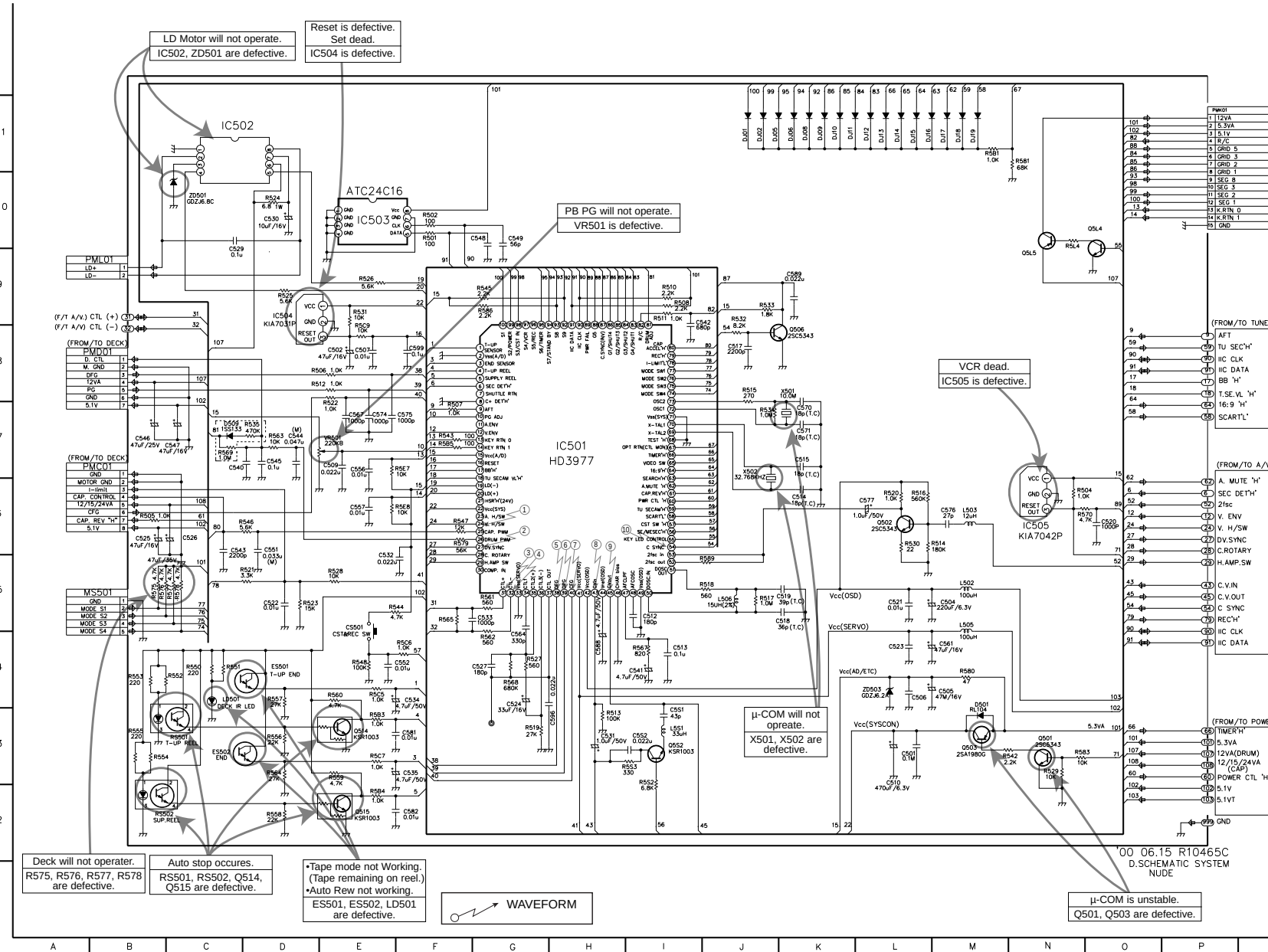
* IC103 Voltage Sheet

	Emitter		Collector		Base	
	PB	REC	PB	REC	PB	REC
IC103	2.5	2.5	0.0	0.0	3.9	3.9

2. A/V, SECAM Circuit Diagram



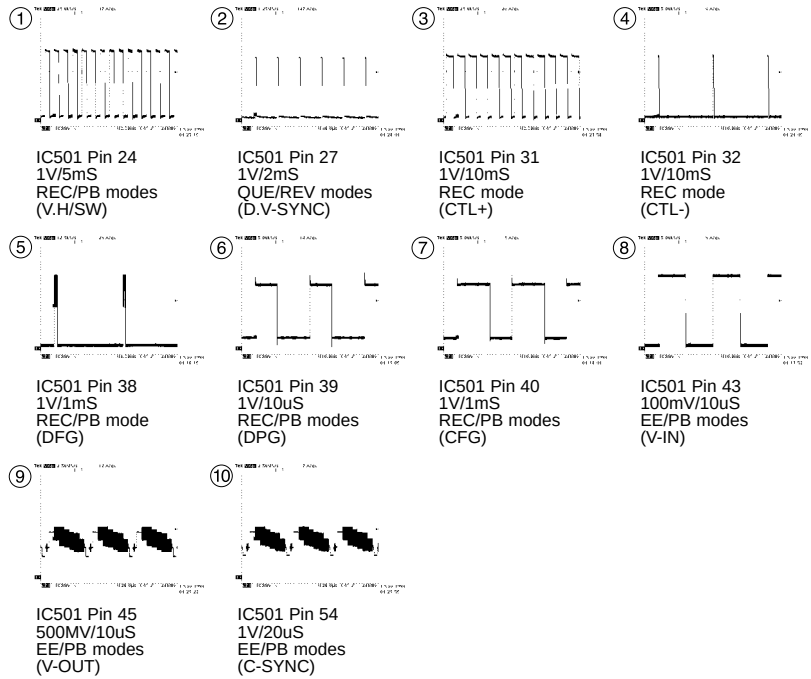
3. System Circuit Diagram



LOCATION GUIDE

999	P2	Q5L5	N9
C501	L3	Q5S2	L3
C502	E8	R501	F10
C504	M5	R502	F10
C505	M4	R504	N6
C506	L4	R505	B6
C507	E8	R506	B6
C509	E7	R507	F7
C510	L3	R508	B9
C512	L5	R510	B9
C513	L4	R511	B9
C514	K6	R512	B8
C515	K7	R513	H3
C517	J8	R514	M6
C518	J5	R515	J8
C519	J5	R516	L6
C520	O6	R517	J5
C521	L5	R518	L5
C522	O5	R519	C3
C523	L4	R520	L6
C524	G4	R521	C5
C525	B6	R522	E7
C526	C6	R523	O5
C527	G4	R524	O10
C529	C9	R525	O9
C530	D10	R526	E9
C531	H3	R527	G4
C532	E5	R528	E5
C533	G5	R529	N3
C534	F4	R530	L6
C535	F3	R531	L6
C540	C7	R532	J9
C541	A1	R533	J9
C542	I9	R534	J7
C543	C6	R535	O7
C544	O7	R536	N3
C545	D7	R537	F7
C546	E7	R538	F4
C547	B7	R539	O9
C548	F10	R540	C6
C549	O10	R541	F6
C551	D6	R542	E4
C552	E8	R543	C4
C556	E7	R544	C4
C557	E8	R545	B4
C561	M4	R546	B3
C564	G4	R547	B3
C567	F7	R548	O3
C570	K7	R549	O3
C571	F7	R550	E4
C574	F7	R551	O2
C575	C6	R552	O3
C576	M6	R553	E4
C577	L6	R554	O5
C581	F3	R555	G4
C582	F2	R556	O7
C588	H4	R557	O3
C589	K9	R558	F5
C596	H3	R559	I4
C599	F8	R560	G4
C551	L3	R561	C7
C552	L3	R562	C7
C553	L3	R563	C7
C554	L3	R564	C7
C555	L3	R565	C7
C556	L3	R566	C7
C557	L3	R567	C7
C558	L3	R568	C7
C559	L3	R569	C7
C560	L3	R570	C7
C561	L3	R571	C7
C562	L3	R572	C7
C563	L3	R573	C7
C564	L3	R574	C7
C565	L3	R575	C7
C566	L3	R576	C7
C567	L3	R577	C7
C568	L3	R578	C7
C569	L3	R579	C7
C570	L3	R580	C7
C571	L3	R581	C7
C572	L3	R582	C7
C573	L3	R583	C7
C574	L3	R584	C7
C575	L3	R585	C7
C576	L3	R586	C7
C577	L3	R587	C7
C578	L3	R588	C7
C579	L3	R589	C7
C580	L3	R590	C7
C581	L3	R591	C7
C582	L3	R592	C7
C583	L3	R593	C7
C584	L3	R594	C7
C585	L3	R595	C7
C586	L3	R596	C7
C587	L3	R597	C7
C588	L3	R598	C7
C589	L3	R599	C7
C590	L3	R600	C7

* IC501 Waveform Photographs



SYSTEM IC Voltage Sheet

IC501(HD3977)														
	PB	REC	PB	REC	PB	REC	PB	REC	PB	REC	PB			
1	0	0	21	5.24	5.24	41	5.24	5.24	61	0	81	2.55	2.55	
2	0	0	22	5.24	5.24	42	4.99	4.99	62	0	82	5.07	5.07	
3	0.78	0.79	23	H/L	H/L	43	2.41	2.37	63	0	83	0	0	
4	H/L	H/L	24	H/L	H/L	44	1.36	1.36	64	5.21	5.21	84	0	0
5	H/L	H/L	25	2.81	2.81	45	2.43	2.43	65	5.21	5.21	85	0	0
6	3.34	3.3	26	2.73	2.73	46	0	0	66	0	86	0	0	
7	1	2	27	0	0	47	2.01	2.01	67	4.58	4.58	87	4.7	4.7
8	1	2	28	H/L	H/L	48	1.41	1.41	68	0	88	0	0	0
9	3.2	1.62	29	5.15	5.15	49	0	0	69	1.45	1.45	89	4.87	4.87
10	2.2	2.2	30	4.97	4.88	50	1.32	1.32	70	0.83	0.83	90	5.08	5.08
11	0.74	0	31	2.25	2.99	51	1.35	1.35	71	0	91	5.03	5.03	
12	4.0	2.3	32	2.25	2.2	52	2.5	2.5	72	2.49	2.47	92	5.28	5.28
13	5.28	5.28	33	0	0	53	2.43	2.43	73	2.47	2.47	93	5.28	5.28
14	5.28	5.28	34	0	0	54	0.98	0.98	74	5.29	5.29	94	4.6	4.6
15	5.28	5.28	35	2.25	2.25	55	5.21	5.21	75	0	95	5.2	5.2	
16	5.24	5.28	36	2.25	2.25	56	0	0	76	5.29	5.29	96	0	0
17	0	0	37	2.25	2.25	57	5.05	5.05	77	2.29	5.29	97	0	0
18	0	0	38	Pulse	Pulse	58	5.16	5.20	78	3.14	3.15	98	0	0
19	5.18	5.18	39	Pulse	Pulse	59	0	0	79	0	4.84	99	0	0
20	5.18	5.18	40	Pulse	Pulse	60	5.21	5.14	80	2.8	2.8	100	0	0

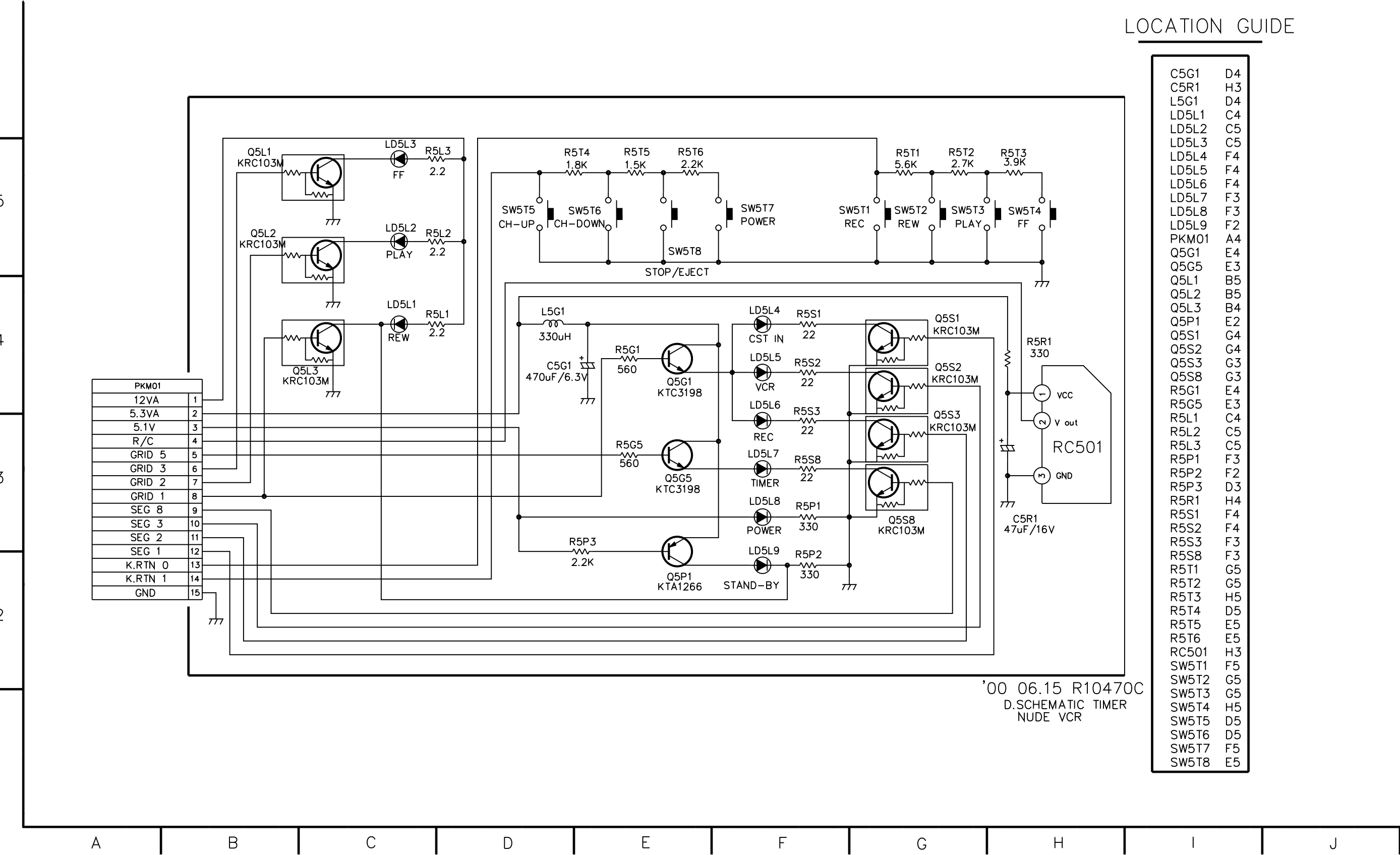
IC503 Voltage Sheet

IC503			
PB	REC	PB	REC
5.34	0.00	4.60	4.60
5.34	0.00	5.21	5.21
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00

System IC Voltage Sheet

	Emitter		Collector		Base	
	PB	REC	PB	REC	PB	REC
Q514	0	0	H/L	H/L	H/L	H/L
Q515	0	0	H/L	H/L	H/L	H/L
Q506	0	0	0.7	0.7	0.4	0.4
Q503	5.32	5.32	5.25	5.24	4.43	4.43
Q501	0	0	0	0	0.75	0.75

5. KEY Circuit Diagram



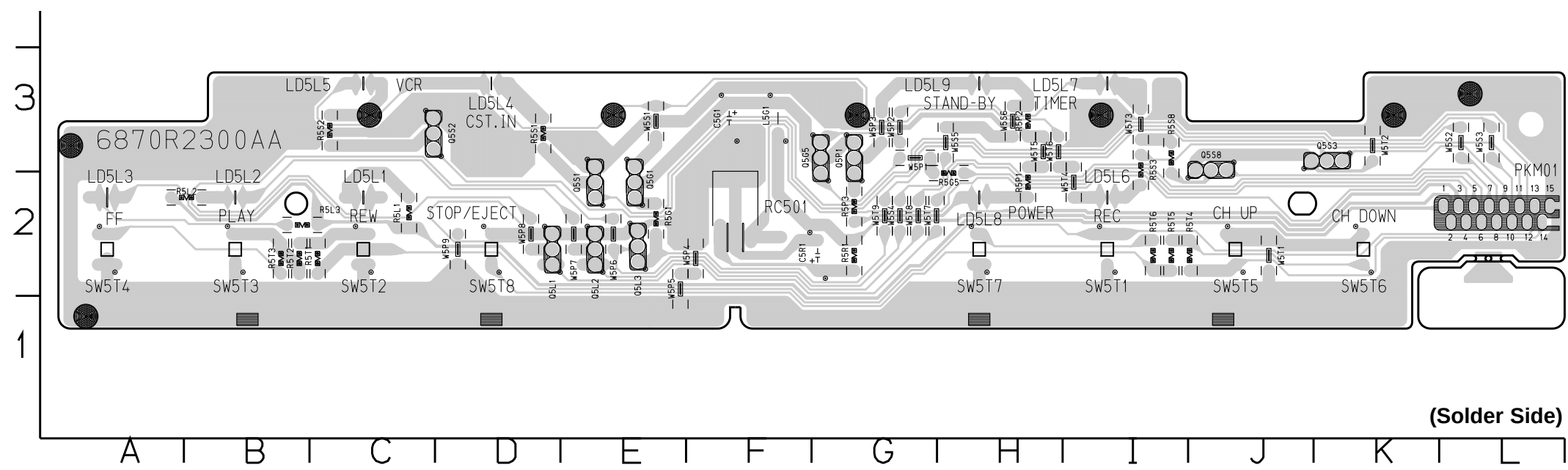
1. MAIN P.C.Board



NOTE : ● Measurement Point
 □ : Adjustment Point
 ○ Emitter : TRANSISTOR
 ○ Collector
 ○ Base

(Solder Side)

2. KEY P.C.Board



LOCATION GUIDE

C5G1	F3	R5L2	B2
C5R1	G2	R5L3	B2
L5G1	F3	R5P1	H2
LD5L1	C2	R5P2	H3
LD5L2	B2	R5P3	G2
LD5L3	A2	R5R1	G2
LD5L4	D3	R5S1	D3
LD5L5	C3	R5S2	C3
LD5L6	I2	R5S3	I3
LD5L7	I3	R5S8	I3
LD5L8	H2	R5T1	C2
LD5L9	H3	R5T2	B2
PKM01	L2	R5T3	B2
Q5G1	E2	R5T4	J2
Q5G5	G3	R5T5	I2
Q5L1	D2	R5T6	I2
Q5L2	E2	RC501	F2
Q5L3	E2	SW5T1	I2
Q5P1	G3	SW5T2	C2
Q5S1	E2	SW5T3	B2
Q5S2	C3	SW5T4	A2
Q5S3	K3	SW5T5	J2
Q5S8	J3	SW5T6	K2
R5G1	E2	SW5T7	H2
R5G5	H2	SW5T8	D2
R5L1	C2		

SECTION 4 MECHANISM

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MECHANISM TROUBLESHOOTING GUIDE

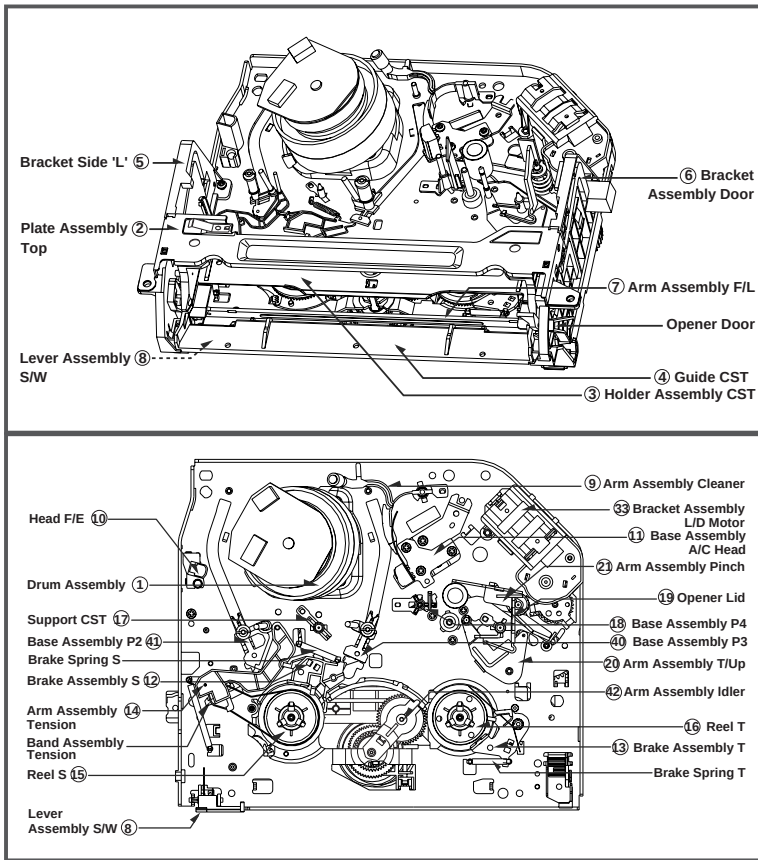
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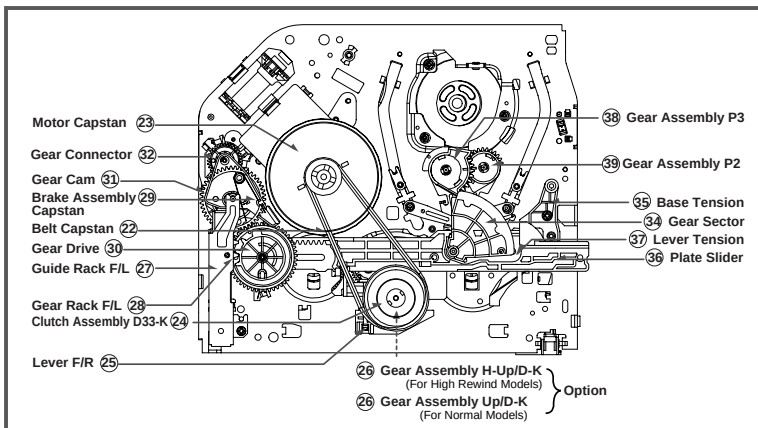
DECK MECHANISM PARTS LOCATIONS(FOR NORMAL MODELS)

• Top View



Pracedure		Part	Fixing Type	Fig-ure
Starting No.				
2	1	Drum Assembly	3 Screws , Cap FPC	A-1
	2	Plate Assembly Top	Two Hooks	A-2
2,3,4	3	Holder Assembly CST	Chassis Hole	A-2
	4	Guide CST	2 Hooks	A-2
2,3,4	5	Bracket Side (L)	1 Screw	A-2
	6	Bracket Assembly Door	1 Screw	A-2
2,3,4,5,6	7	Arm Assembly F/L	Chassis Hole	A-2
	8	Lever Assembly S/W	Chassis Hole	A-2
2,3,4,5	9	Arm Assembly Cleaner	Chassis Embossing	A-3
	10	Head F/E	2 Hooks	A-3
2,3	11	Base Assembly A/C Head	1 Screw	A-3
	12	Brake Assembly S	Chassis Hole	A-4
2,3,12	13	Brake Assembly T	Chassis Hole	A-4
	14	Arm Assembly Tension	Chassis Hole	A-4
2,3,12,14	15	Reel S	Chassis Shaft	A-4
	16	Reel T	Chassis Shaft	A-4
2,3,13	17	Support CST	Chassis Embossing	A-5
	18	Base Assembly P4	Chassis Embossing	A-5
19	19	Opener Lid	Chassis Embossing	A-5
	20	Arm Assembly T/Up	Chassis Embossing	A-5
19	21	Arm Assembly Pinch	Chassis Shaft	A-5

• Bottom View



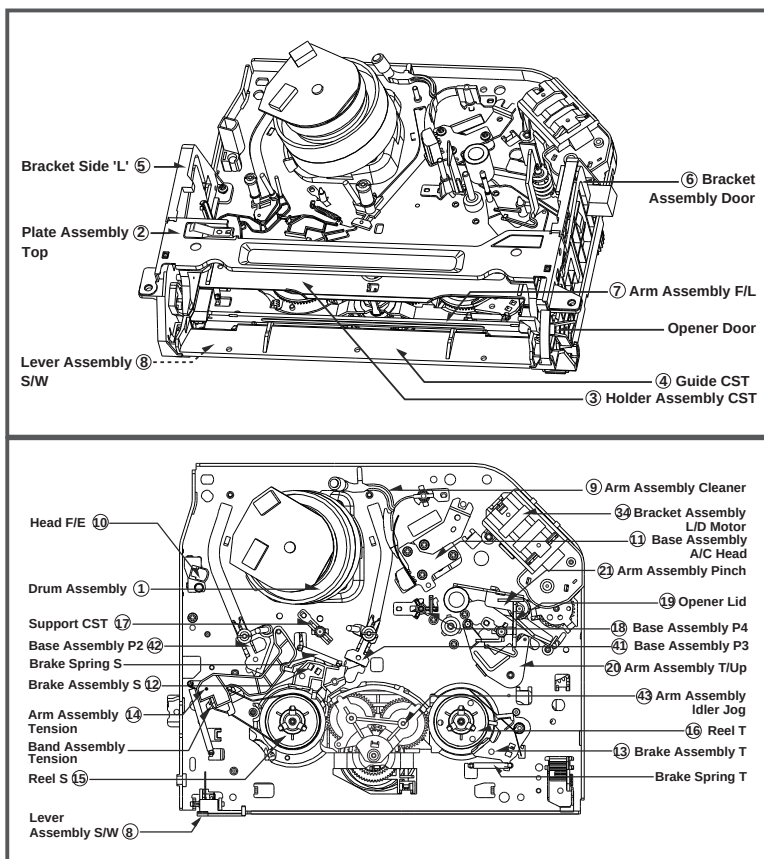
NOTE : When reassembly perform the procedure in the reverse order.

- 1) When reassembling, confirm Mechanism and Mode Switch Alignment Position (Pefer to Page 4-14)
- 2) When disassembling, the Parts for Starting No. Should be removed first.

Pracedure		Part	Fixing Type	Fig-ure
Starting No.				
22	22	Belt Capstan	3 Screws	A-6
	23	Motor Capstan	1 Washer	A-6
22,24	24	Clutch Assembly D33-K	1 Hook	A-6
	25	Lever F/R	2 Washers	A-6
22,24	26	Gear H-Up/D-K	1Screw	A-7
	27	Guide Rack F/L	Chassis Shaft	A-7
27	28	Gear Rack F/L	Chassis Shaft	A-7
	29	Brake Assembly Capstan	1 Washer	A-8
27, 28	30	Gear Drive	Chassis Shaft	A-8
	31	Gear Cam	Chassis Shaft	A-8
27, 28, 29	32	Gear Connector	Chassis Shaft	A-8
	33	Bracket Assembly L/D Motor	3 Hooks	A-8
27, 28, 29, 30	34	Gear Sector	3 Washers	A-9
	35	Base Tension	1 Screw	A-9
22, 24, 25, 27, 28, 30, 34	36	Plate Slider	Chassis Shaft	A-9
22, 24, 25, 27, 28, 30, 34	37	Lever Tension	Chassis Hole	A-9
34, 38	38	Gear Assembly P3	2 Hooks	A-10
	39	Gear Assembly P2	2 Hooks	A-10
34, 38, 39	40	Base Assembly P3	Chassis Hole	A-10
	41	Base Assembly P2	Chassis Hole	A-10
1, 2	42	Arm Assembly Idler	1 Hook	A-10

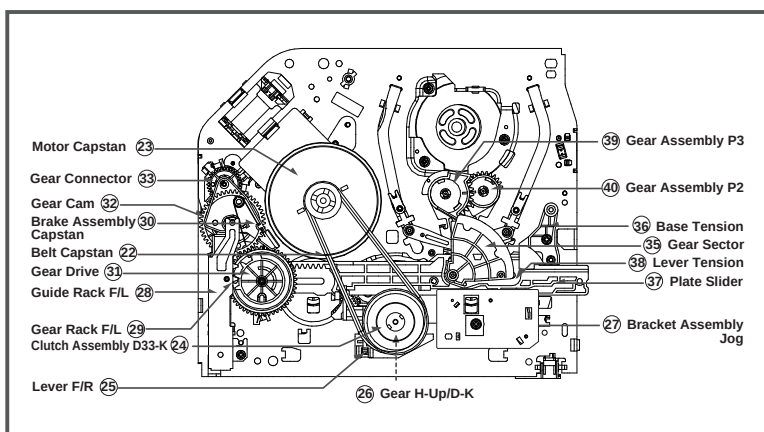
DECK MECHANISM PARTS LOCATIONS(FOR JOG SHUTTLE MODELS)

• Top View



Pracedure	Starting No.	Part	Fixing Type	Figure
	1	Drum Assembly	3 Screws , Cap FPC	A-1
	2	Plate Assembly Top	Two Hooks	A-2
	3	Holder Assembly CST	Chassis Hole	A-2
	4	Guide CST	2 Hooks	A-2
	5	Bracket Side (L)	1 Screw	A-2
	6	Bracket Assembly Door	1 Screw	A-2
	7	Arm Assembly F/L	Chassis Hole	A-2
	8	Lever Assembly S/W	Chassis Hole	A-2
	9	Arm Assembly Cleaner	Chassis Embossing	A-3
	10	Head F/E	2 Hooks	A-3
	11	Base Assembly A/C Head	1 Screw	A-3
	12	Brake Assembly S	Chassis Hole	A-4
	13	Brake Assembly T	Chassis Hole	A-4
	14	Arm Assembly Tension	Chassis Hole	A-4
	15	Reel S	Chassis Shaft	A-4
	16	Reel T	Chassis Shaft	A-4
	17	Support CST	Chassis Embossing	A-5
	18	Base Assembly P4	Chassis Embossing	A-5
	19	Opener Lid	Chassis Embossing	A-5
	20	Arm Assembly T/Up	Chassis Embossing	A-5
	21	Arm Assembly Pinch	Chassis Shaft	A-5

• Bottom View



NOTE : When reassembly perform the procedure in the reverse order.

- 1) When reassembling, confirm Mechanism and Mode Switch Alignment Position (Pefer to Page 4-14)
- 2) When disassembling, the Parts for Starting No. Should be removed first.

Pracedure	Starting No.	Part	Fixing Type	Figure
	22	Belt Capstan	3 Screws	A-6
	23	Motor Capstan	1 Washer	A-6
	24	Clutch Assembly D33-K	1 Hook	A-6
	25	Lever F/R	2 Washers	A-6
	26	Gear H-Up/D-K	1 Screw	A-7
	27	Bracket Assembly Jog	1 Screw	A-7
	28	Guide Rack F/L	Chassis Shaft	A-7
	29	Gear Rack F/L	Chassis Shaft	A-7
	30	Brake Assembly Capstan	1 Washer	A-8
	31	Gear Drive	Chassis Shaft	A-8
	32	Gear Cam	Chassis Shaft	A-8
	33	Gear Connector	3 Hooks	A-8
	34	Bracket Assembly L/D Motor	3 Washers	A-9
	35	Gear Sector	1 Screw	A-9
	36	Base Tension	Chassis Shaft	A-9
	37	Plate Slider	Chassis Shaft	A-9
	38	Lever Tension	Chassis Hole	A-9
	39	Gear Assembly P3	2 Hooks	A-10
	40	Gear Assembly P2	Chassis Hole	A-10
	41	Base Assembly P3	Chassis Hole	A-10
	42	Base Assembly P2	Chassis Hole	A-10
	43	Arm Assembly Idler Jog	1 Hook	A-10

DECK MECHANISM DISASSEMBLY

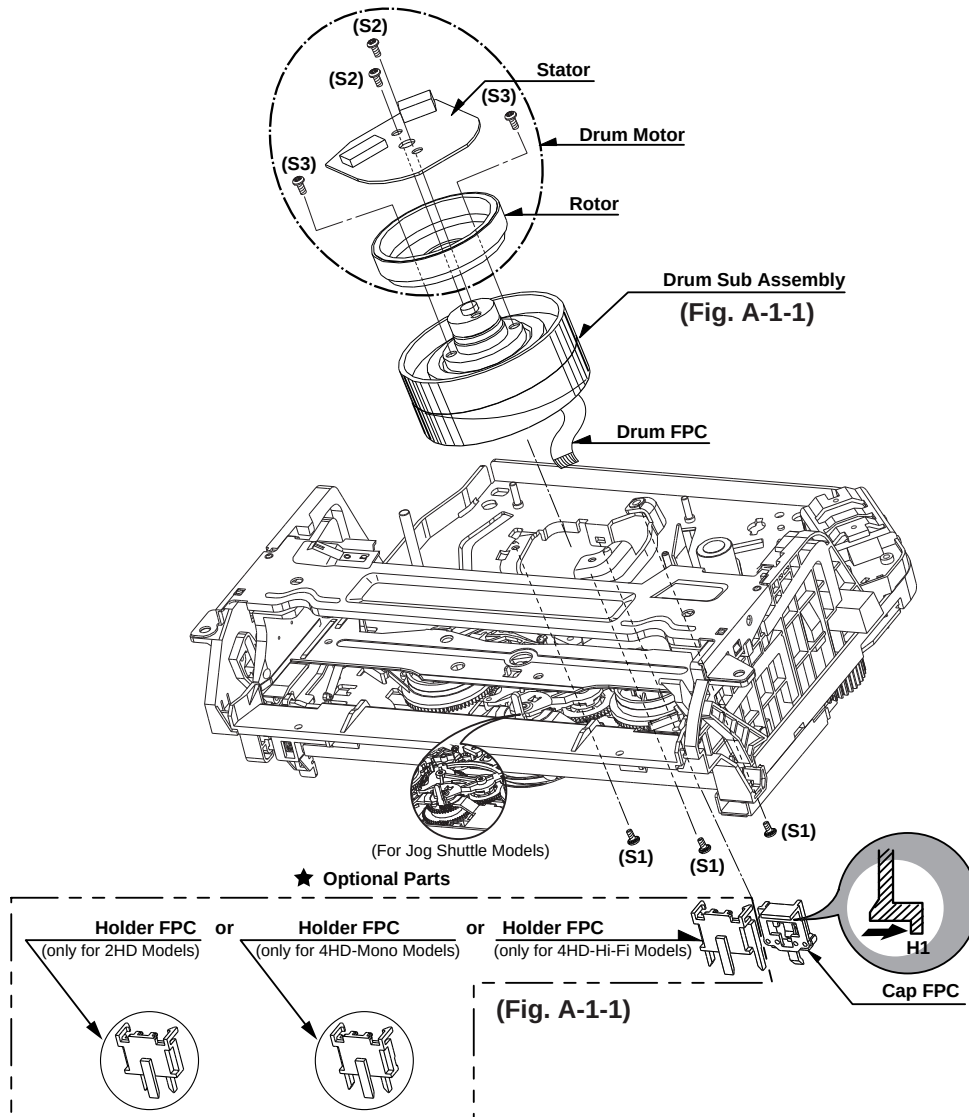


Fig. A-1

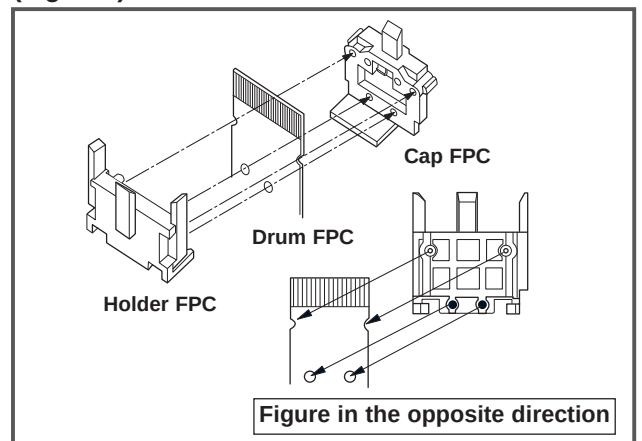
1. Drum Assembly (Fig. A-1-1)

- 1) Unhook the (H1) on the back side of the Chassis and separate the Cap FPC.
- 2) Remove three Screws (S1) and lift up the Drum Assembly.
- 3) Remove two Screws (S2) and Separate the Stator of Drum Motor.
- 4) Remove two Screws (S3) and Separate the Rotor of Drum Motor from the Drum Sub Assembly.

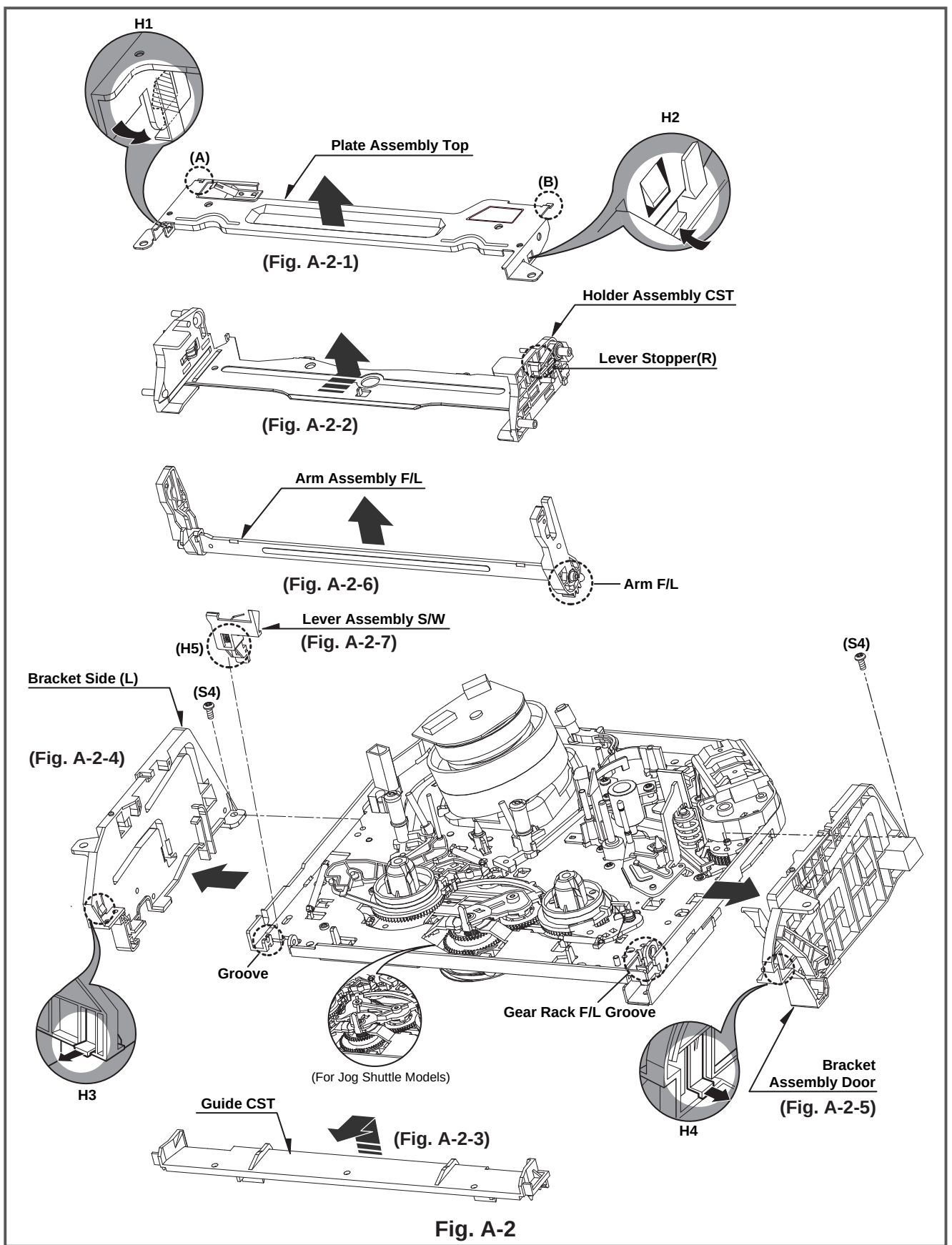
NOTE

- (1) When reassembling Cap FPC, two Holes of Drum FPC are inserted to the two Bosses of Holder FPC correctly. (Refer to Fig. B-1)

(Fig. B-1)



DECK MECHANISM DISASSEMBLY



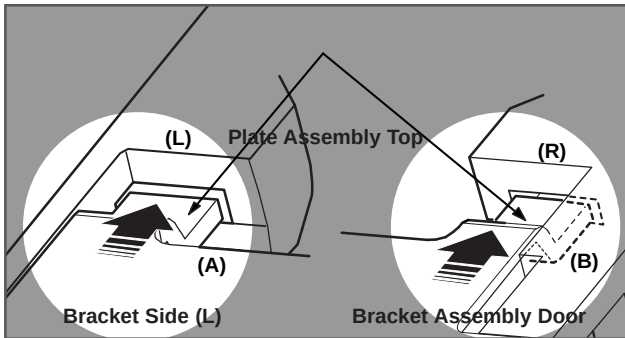
DECK MECHANISM DISASSEMBLY

2. Plate Assembly Top (Fig. A-2-1)

- 1) Unhook the (H1) and separate the Left Side.
- 2) Unhook the (H2) and lift up the Plate Assembly Top.

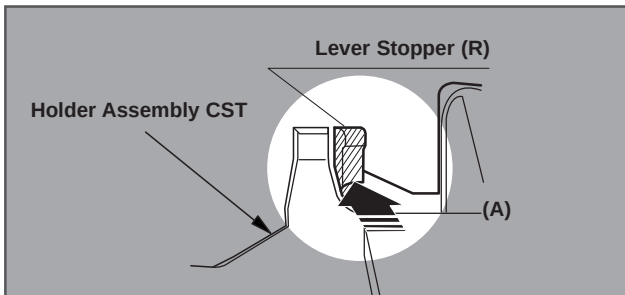
NOTE

- (1) When reassembling, confirm (A),(B) Part of the Plate Assembly Top is inserted to the (L),(R) Grooves of the Bracket Side(L) and Bracket Assembly Door.

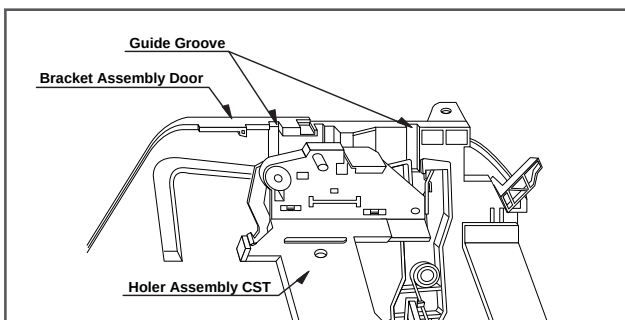


3. Holder Assembly CST (Fig.A-2-2)

- 1) Push the Lever Stopper (R) in the direction of the arrows (A) and move the Holder Assembly CST.

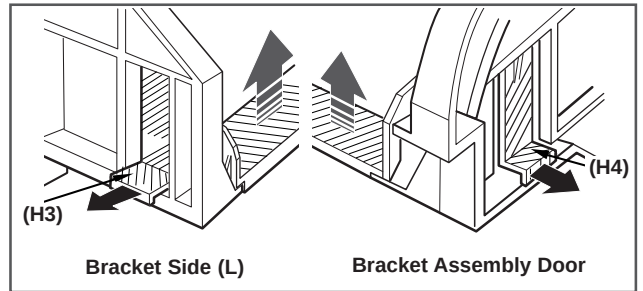


- 2) Push the Bracket Assembly Door to the right and lift up the Holder Assembly CST along the Guide Groove of the Bracket Assembly Door.



4. Guide CST (Fig.A-2-3)

- 1) Unhook(H3) in the direction of the arrow and separate the left side.
- 2) Unhook (H4) as above No.1) and disassemble the Guide CST in the direction of the arrow.



5. Bracket Side(L) (Fig. A-2-4)/ Bracket Assembly Door (Fig.A-2-5)

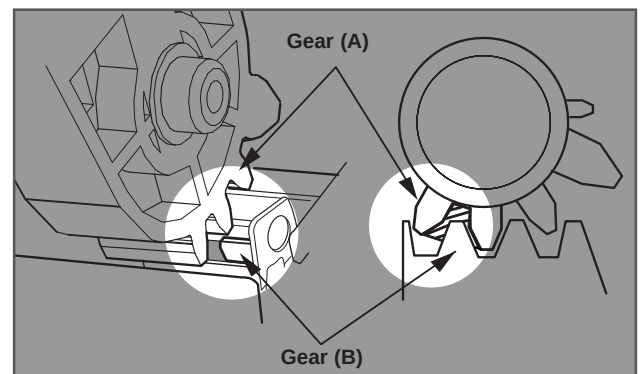
- 1) Remove the Screw (S4) and disassemble the Bracket Side(L) in the front.
- 2) Remove the Screw (S4) and disassemble the Bracket Assembly Door in the front.

6. Arm Assembly F/L (Fig. A-2-6)

- 1) Push the Arm Assembly F/L to the left and lift up it.

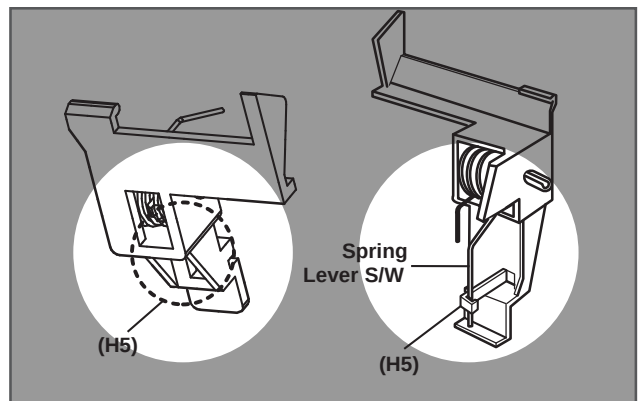
NOTE

- (1) When reassembling, confirm that the Gear(A) of the Arm F/L and the Gear(B) of the Gear Rack F/L are assembled as below.

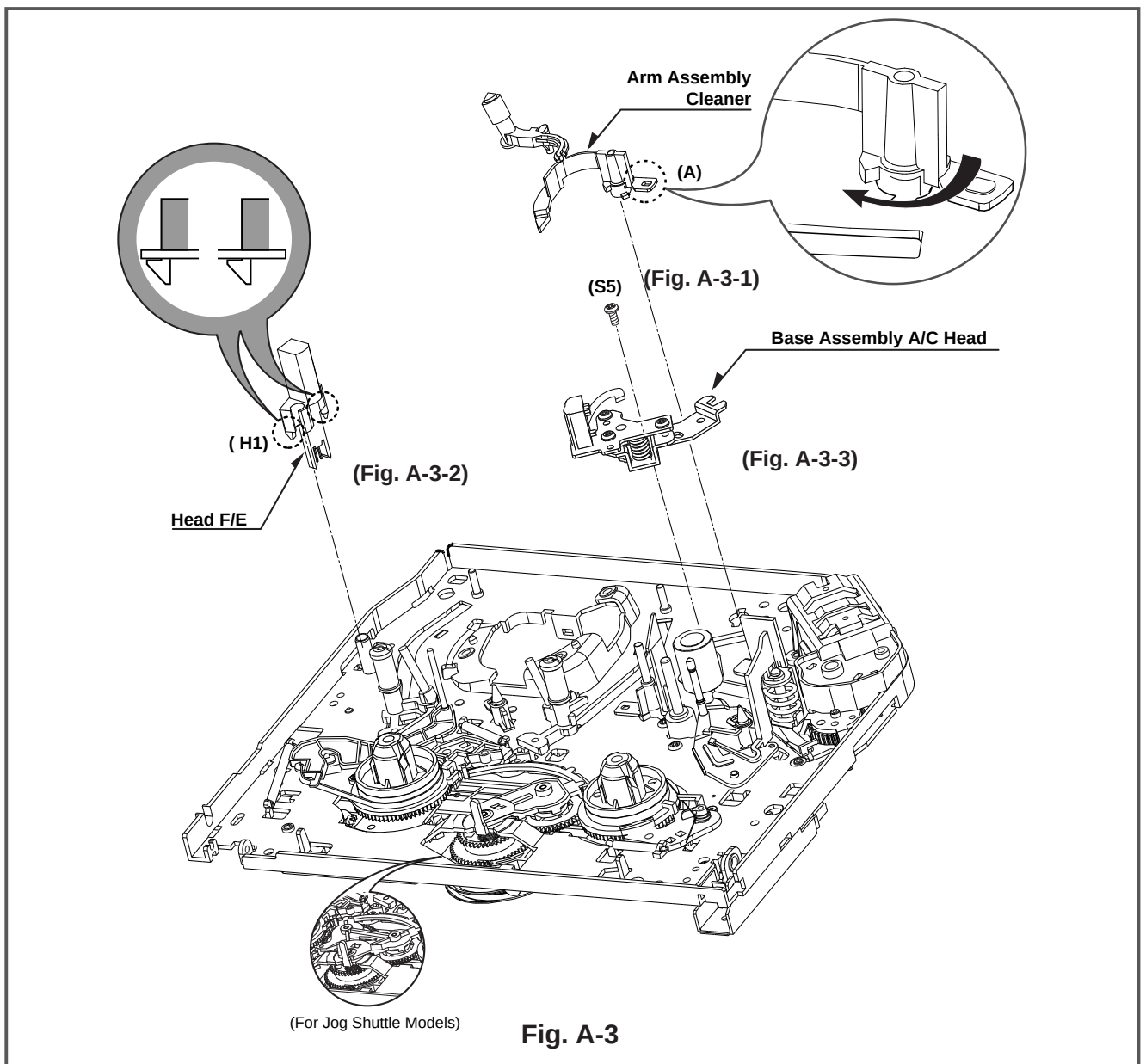


7. Lever Assembly S/W (Fig. A-2-7)

- 1) Hook the Spring Lever S/W on (H5).
- 2) Lift up the left side of the Lever S/W from the Groove(A) of the Chassis.

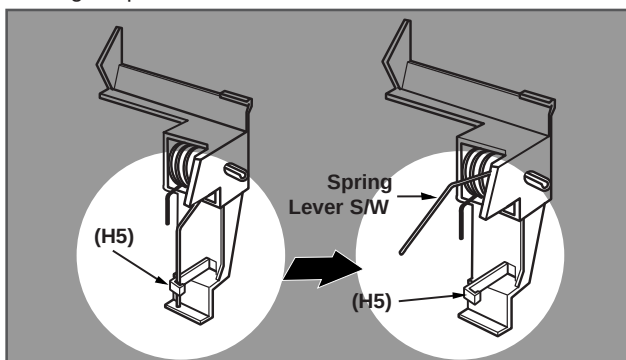


DECK MECHANISM DISASSEMBLY



NOTE

- (1) Place the Spring Lever S/W of the above (No.1) as original position.



8. Arm Assembly Cleaner(Fig. A-3-1)

- 1) Break away the (A) part shown above Fig. A-3-1 from the Embossing of the Chassis in the clockwise direction and lift up the Arm Assembly Cleaner.

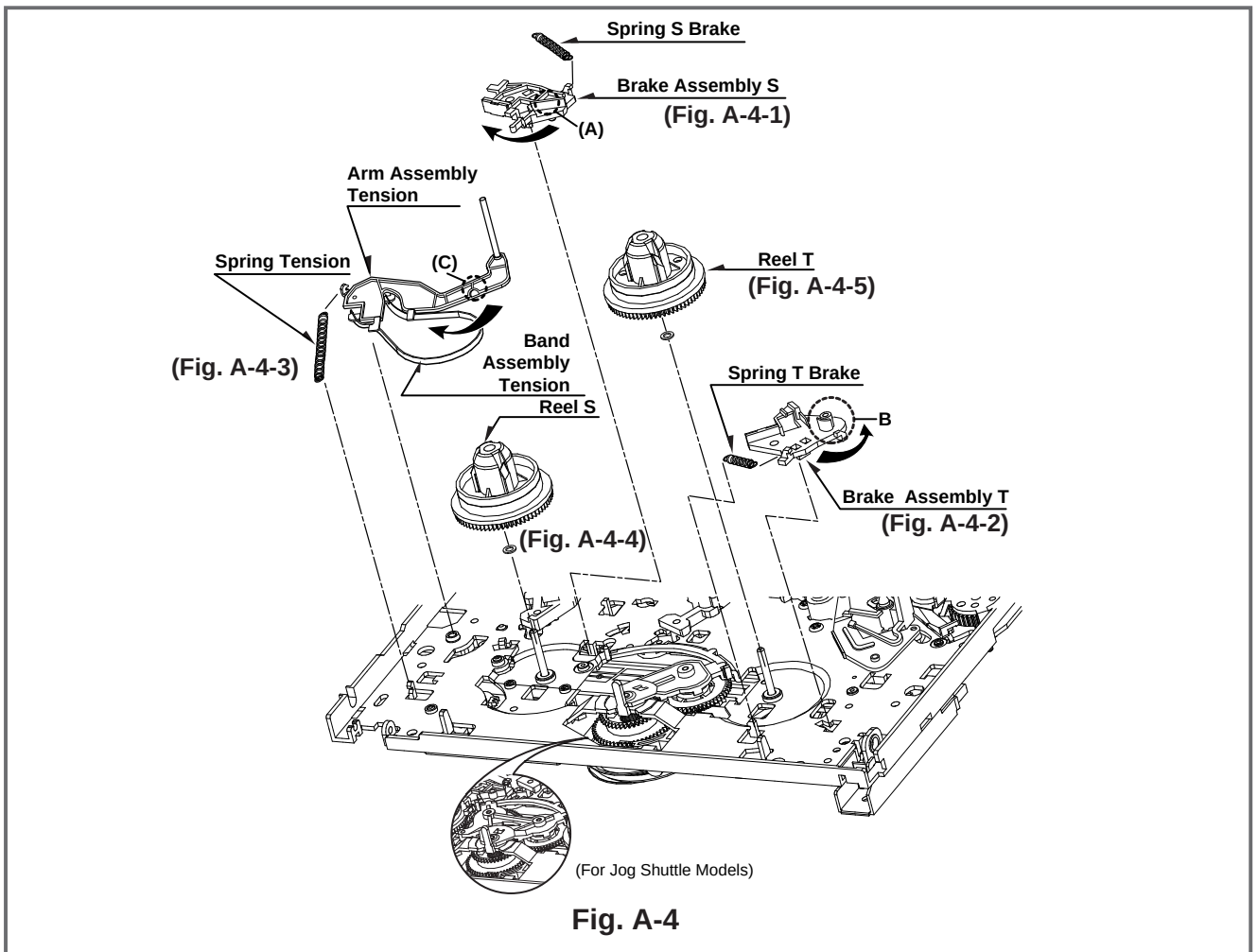
9. Head F/E (Fig. A-3-2)

- 1) Unhook the two Hooks (H1) on the back side of the Chassis and lift up the Head F/E.

10. Base Assembly A/C Head (Fig. A-3-3)

- 1) Remove the Screw (S5) and lift up the Base Assembly A/C Head.

DECK MECHANISM DISASSEMBLY



11. Brake Assembly S (Fig. A-4-1)

- 1) Remove the Spring S Brake.
- 2) Hold the (A) part shown above Fig. A-4-1 and turn to the clockwise direction, and then lift up the Brake Assembly S.

NOTE

- (1) When reassembling, be careful not to change the Spring with below No.12.(Refer to Fig. B-2).

12. Brake Assembly T (Fig. A-4-2)

- 1) Remove the Spring T Brake.
- 2) Hold the (B) part shown above Fig. A-4-2 and turn to the counterclockwise direction, and then lift up the Brake Assembly T.

NOTE

- (1) When reassembling, be careful not to change the Spring with above No.11.(Refer to Fig. B-2).

(Difference for Springs)

(Fig. B-2)

	Spring T Brake Color (Black)
	Spring S Brake
	Spring Tension

13. Arm Assembly Tension (Fig. A-4-3)

- 1) Remove the Spring Tension.
- 2) Hold the (C) part shown above Fig. A-4-3 and turn to the clockwise direction, and then lift up the Arm Assembly Tension.

NOTE

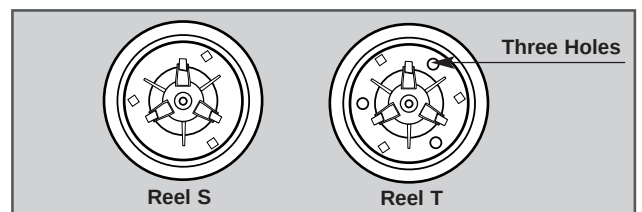
- (1) When reassembling, be careful not to change the Spring with above No.11,12.(Refer to Fig. B-2).

14. Reel S (Fig. A-4-4) & Reel T (Fig. A-4-5)

- 1) Lift up the Reel S and Reel T.

NOTE

- (1) When reassembling, be careful not to change the Reel S and Reel T each other.



- (2) Confirm two Slide Washers under the Reel S and Reel T.

DECK MECHANISM DISASSEMBLY

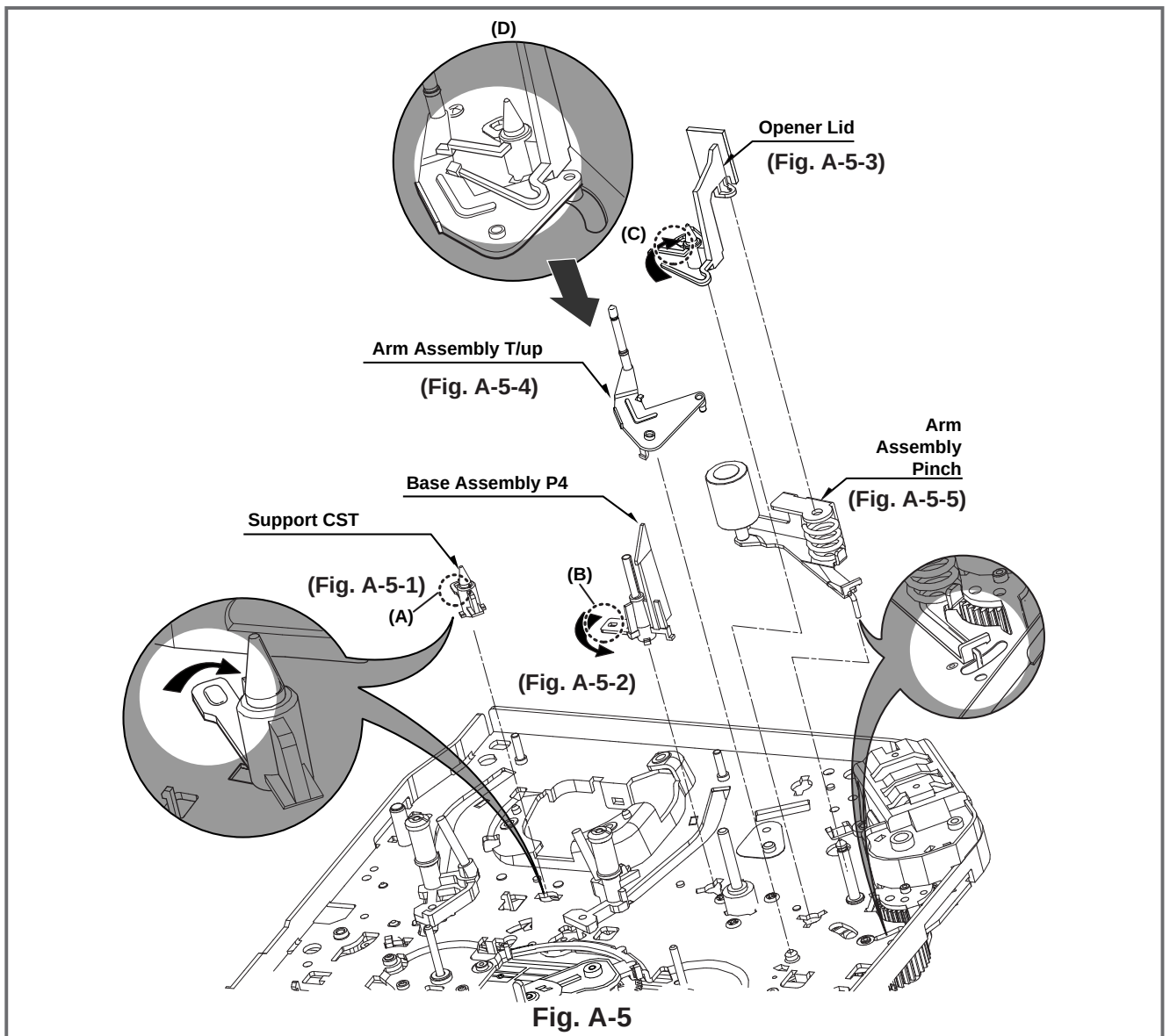


Fig. A-5

15. Support CST (Fig. A-5-1)

- 1) Break away the (A) part shown above Fig. A-5-1 from the Embossing of the Chassis in the clockwise direction, and lift up the Support CST.

16. Base Assembly P4 (Fig. A-5-2)

- 1) Break away the (B) part shown above Fig. A-5-2 from the Embossing of the Chassis in the counterclockwise direction and lift up the Base Assembly P4.

17. Opener Lid (Fig. A-5-3)

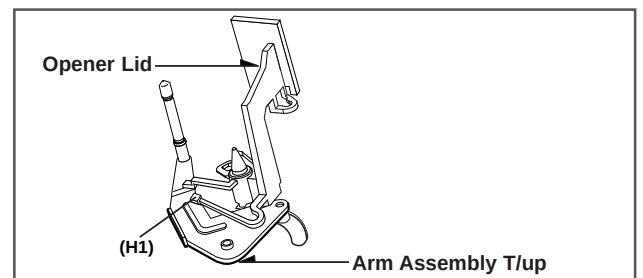
- 1) Break away the (C) Part of the Opener Lid from the Embossing of the Chassis in the Clockwise direction and lift up the Opener Lid.

18. Arm Assembly T/up (Fig. A-5-4)

- 1) Just lift up the Arm Assembly T/UP.

NOTE

- (1) When reassembling, confirm the opener lid is placed on the Hook(H1) of the Arm Assembly T/UP as below figure.



19. Arm Assembly Pinch (Fig. A-5-5)

- 1) Lift up the Arm Assembly Pinch.

DECK MECHANISM DISASSEMBLY

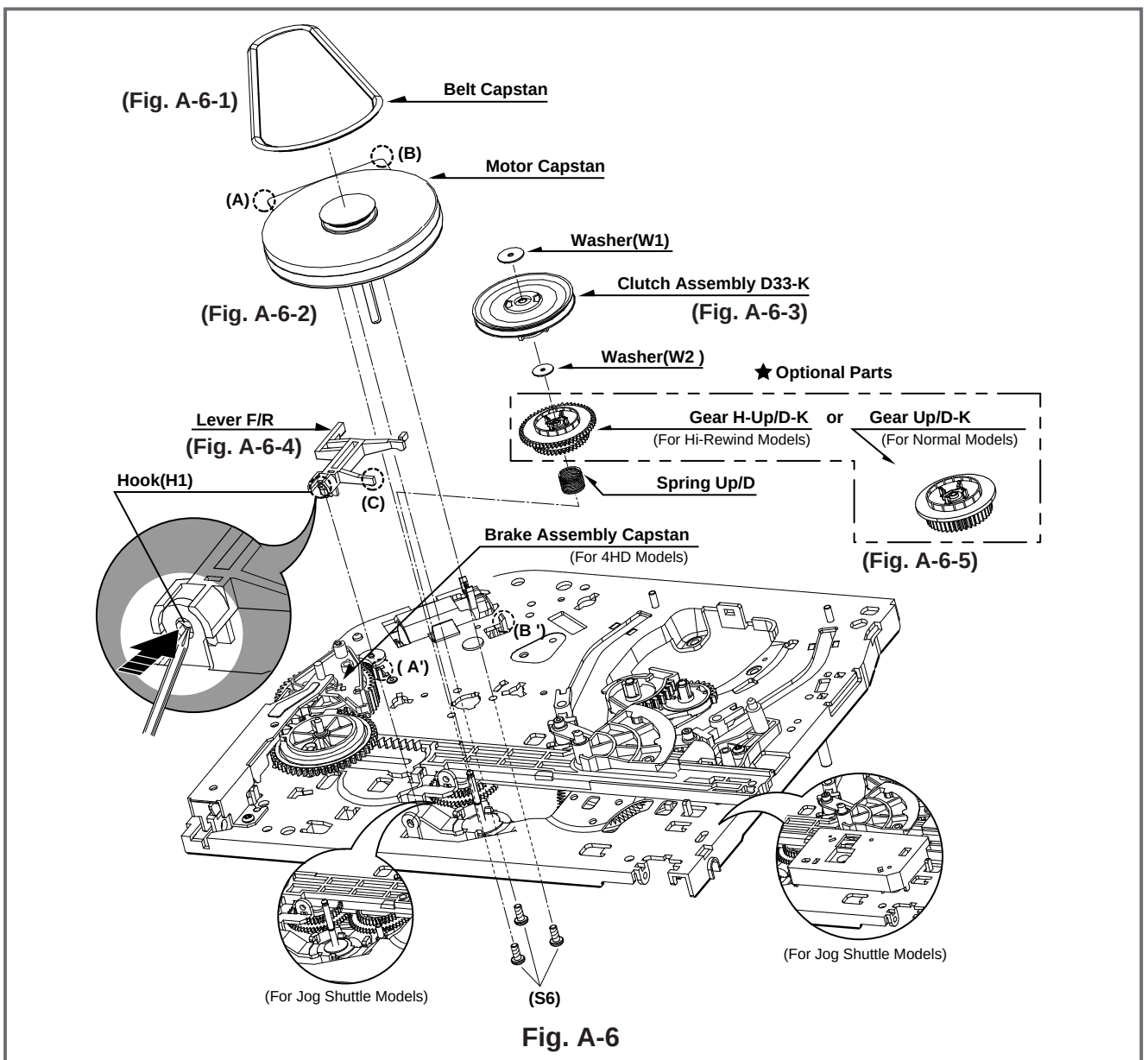


Fig. A-6

20. Belt Capstan (Fig. A-6-1)/ Motor Capstan (Fig. A-6-2)

- 1) Remove the Belt Capstan.
- 2) Remove three Screws(S6) on the back side of the Chassis and lift up the Motor Capstan.

NOTE

- (1) When reassembling, Confirm the (A), (B) parts of Motor Capstan is located to the (A'), (B') of the Chassis.

21. Clutch Assembly D33-K (Fig. A-6-3)

- 1) Remove the Washer(W1) and lift up the Clutch Assembly D33-K.

22. Lever F/R (Fig. A-6-4)

- 1) Unhook the (H1) shown above Fig. A-6-4 and lift up the Lever F/R.

NOTE

- (1) When reassembling, move the (C) part of the Lever F/R up and down, then confirm if it is returned to original position.

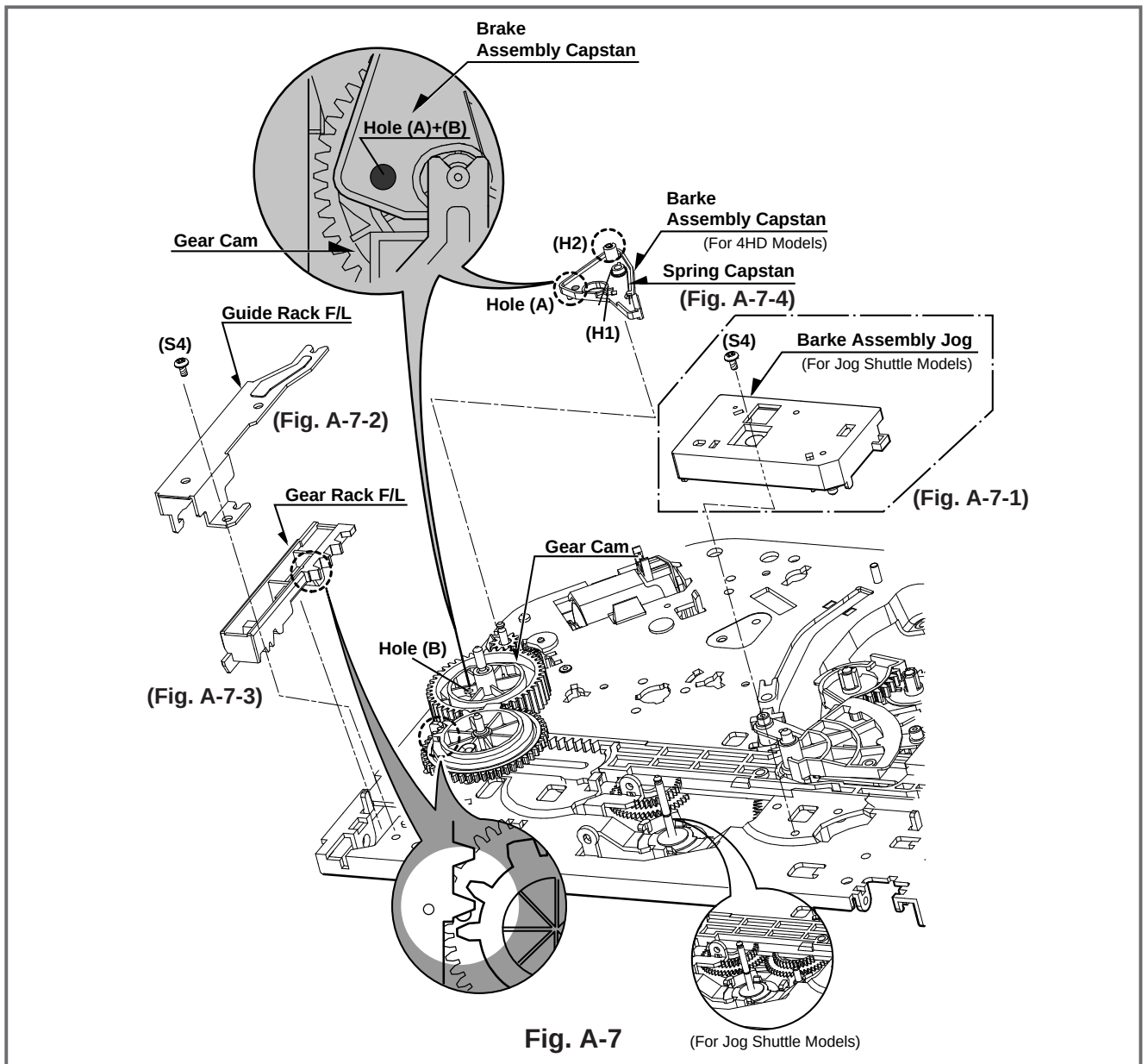
23. Gear H-Up/D-K or Gear Up/D-K (Fig. A-6-5)

- 1) Remove the Washer(W2) and lift up the Gear H-up/D-K.
- 2) Remove the Spring Up/D.

NOTE

- (1) Gear H-Up/D-K is for Hi-Rewind Models.
- (2) Gear Up/D-K is for Normal Models except Hi-Rewind Models.

DECK MECHANISM DISASSEMBLY



24. Bracket Assembly Jog (Fig. A-7-1) (Jog shuttle model option)

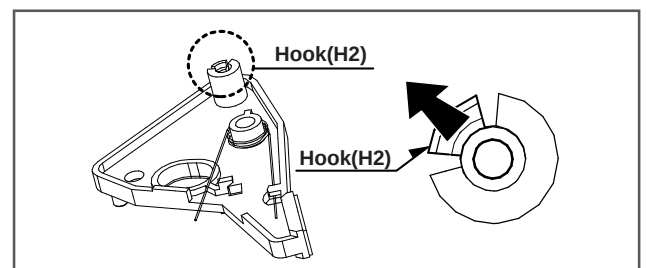
- 1) Remove the Screw(S4) and lift up the Bracket Assembly Jog.

25. Guide Rack F/L (Fig. A-7-2)/ Gear Rack F/L (Fig. A-7-3)

- 1) Remove the Screw(S4) and lift up the Guide Rack F/L.
- 2) Lift up the Gear Rack F/L.

26. Brake Assembly Capstan (Fig. A-7-4) (4HD model option)

- 1) Hook the Spring Capstan on the Hook(H1).
- 2) Unhook the Hook(H2) and lift up the Brake Assembly Capstan.(Refer to Fig. to the right)



NOTE

- (1) When reassembling, confirm that the Hole(A) of the Brake Assembly Capstan is aligned to the Hole(B) of the Gear Cam.
(Refer to above Fig. A-7-4).

DECK MECHANISM DISASSEMBLY

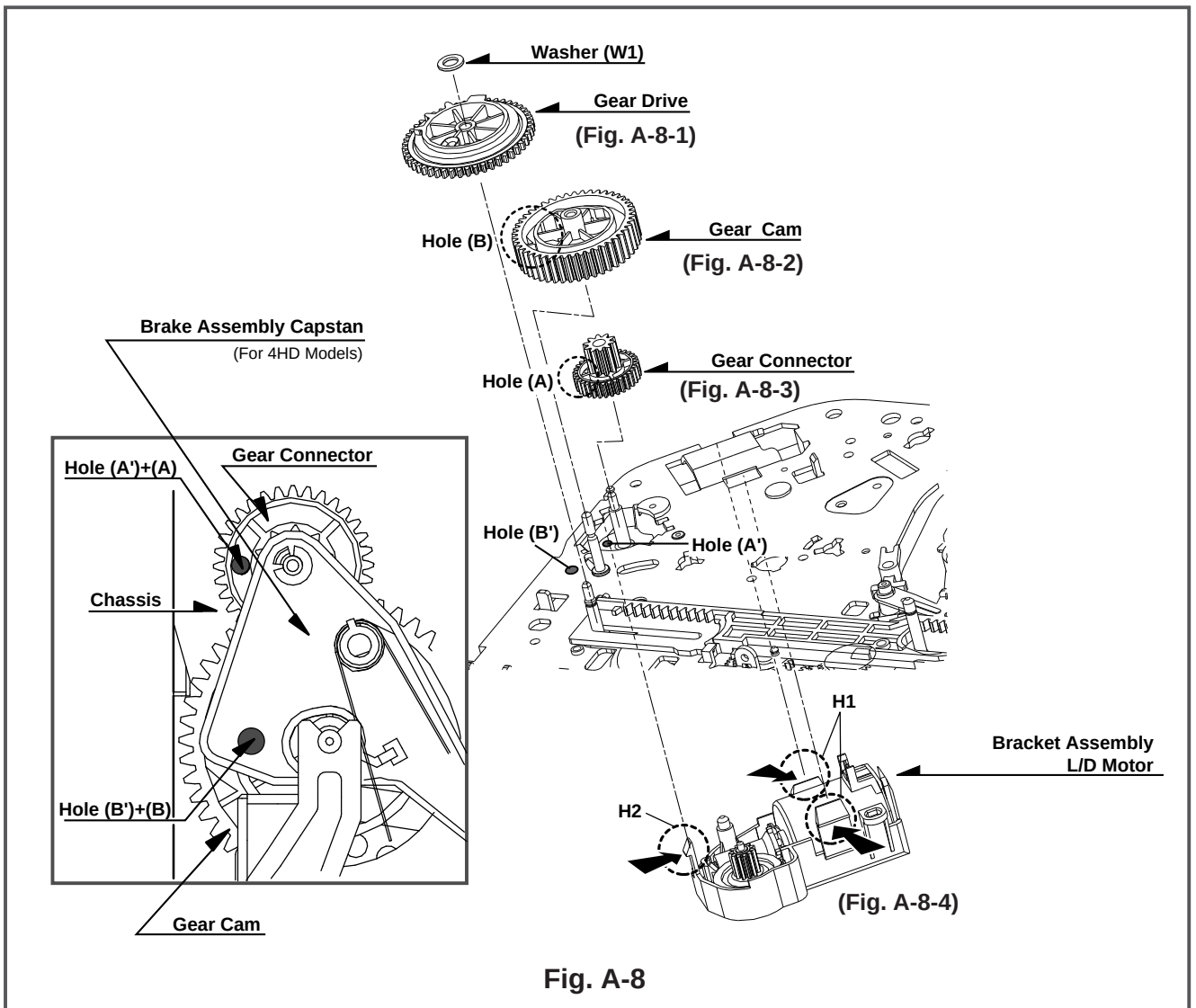


Fig. A-8

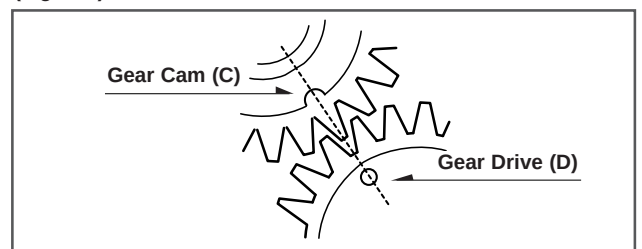
27. Gear Drive (Fig. A-8-1)/ Gear Cam (Fig. A-8-2)/ Gear Connector (Fig. A-8-3)

- 1) Remove the Washer(W1) and lift up the Gear Drive.
- 2) Lift up the Gear Cam.
- 3) Lift up the Gear Connector.

NOTE

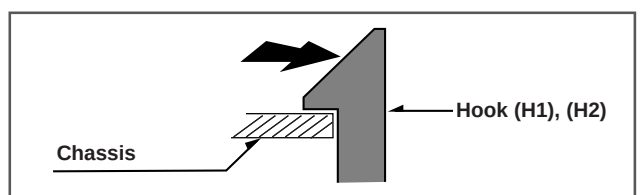
- (1) When reassembling, confirm that the Hole (A) of the Gear Connector is aligned to the Hole (A') of the Chassis (Fig. A-8-3).
- (2) When reassembling, confirm that the Hole (B) of the Gear Cam is aligned to the Hole (B') of the Chassis (Fig. A-8-2).
- (3) When reassembling, confirm that the (C) part of the Gear Cam is aligned to the (D) part of the Gear Drive as shown Fig. B-3

(Fig. B-3)

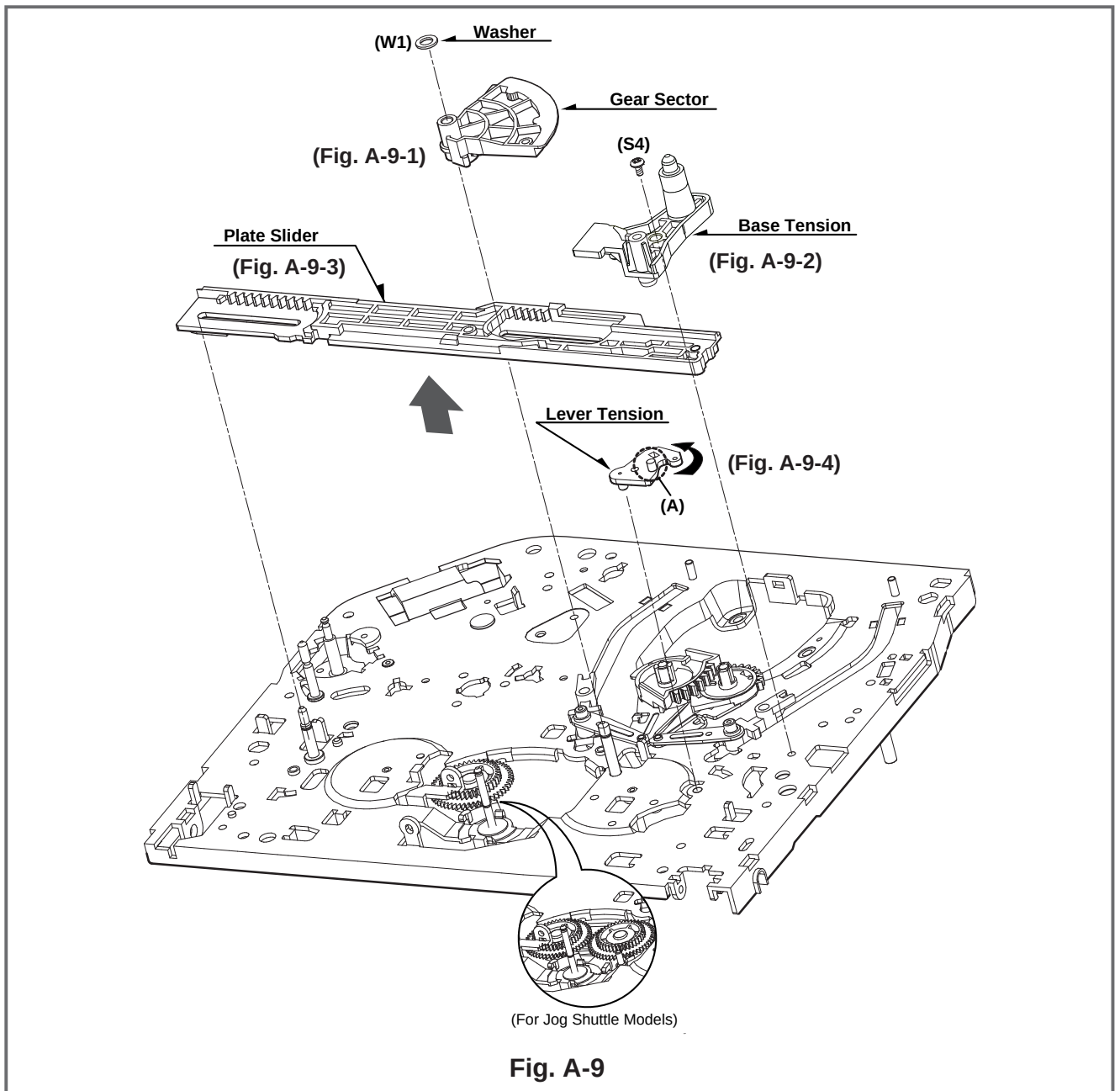


28. Bracket Assembly L/D Motor (Fig. A-8-4)

- 1) Unhook the three Hooks(H1),(H2) and push down the Bracket Assembly L/D Motor.



DECK MECHANISM DISASSEMBLY



29. Gear Sector (Fig. A-9-1)

- 1) Remove the Washer(W1) and lift up the Gear Sector.

30. Base Tension (Fig. A-9-2)/

Plate Slider (Fig. A-9-3)/

Lever Tension (Fig. A-9-4)

- 1) Remove the Screw(S4) and lift up the Base Tension.
- 2) Lift up the Plate Slider.
- 3) Hold the (A) Part of the Lever Tension and turn to the counterclockwise direction, and then lift up the Lever Tension.

NOTE

- (1) When reassembling, turn the Lever Tension to the clockwise direction in maximum.
- (2) Push the plate slide right side to be guided by the shaft.

DECK MECHANISM DISASSEMBLY

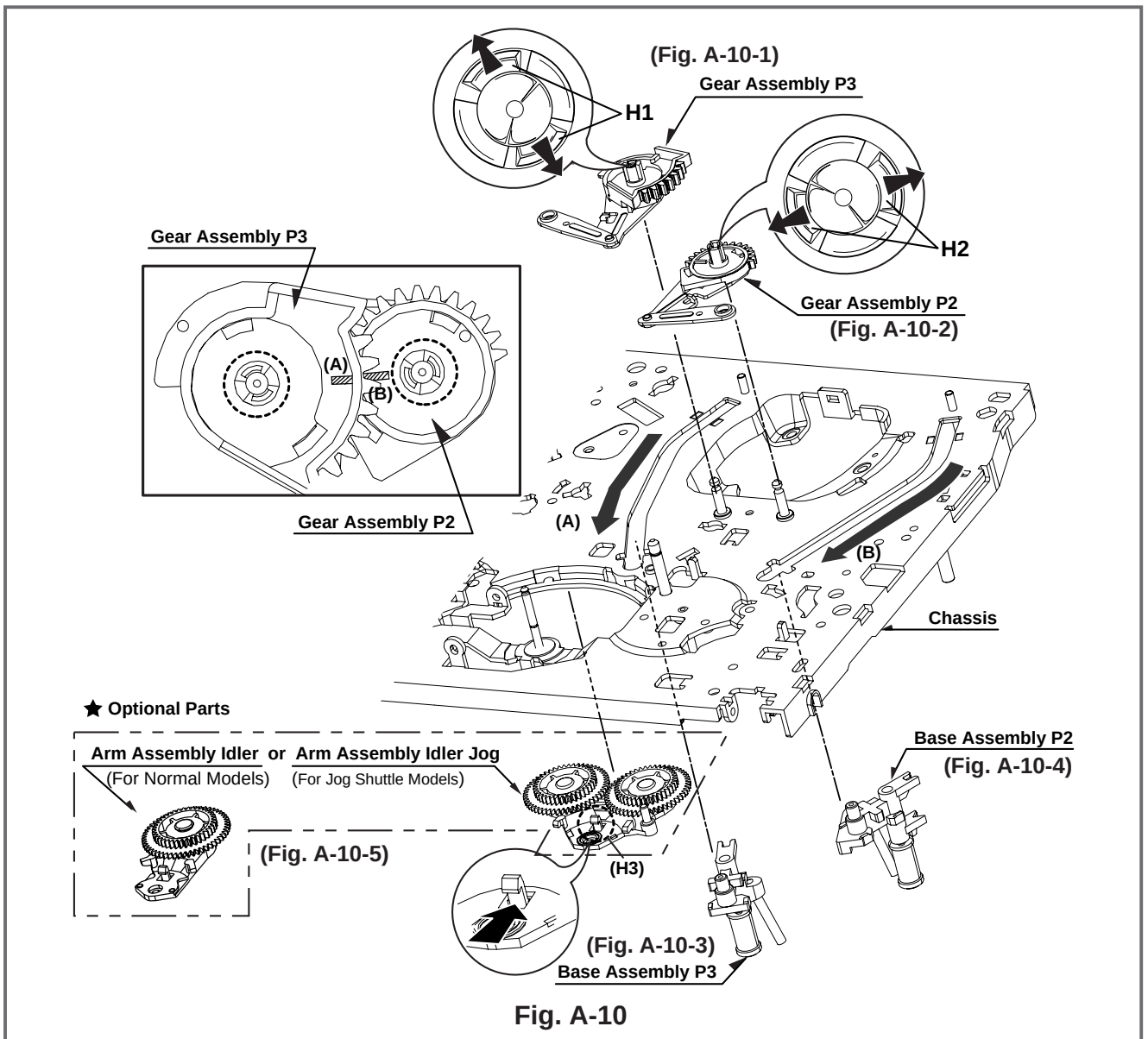


Fig. A-10

31. Gear Assembly P3 (Fig. A-10-1)/ Gear Assembly P2 (Fig. A-10-2)

- 1) Unhook the two Hooks(H1) and lift up the Gear Assembly P3.
- 2) Unhook the two Hooks(H2) and lift up the Gear Assembly P2.

32. Base Assembly P3 (Fig. A-10-3)/ Base Assembly P2 (Fig. A-10-4)

- 1) Move the Base Assembly P3 in the direction of the arrow of the Chassis Hole(A) and push down the Base Assembly P3.
- 2) Move the Base Assembly P2 in the direction of the arrow of the Chassis Hole(B) and push down the Base Assembly P2.

33. Arm Assembly Idler or Arm Assembly Idler Jog(Fig. A-10-5)

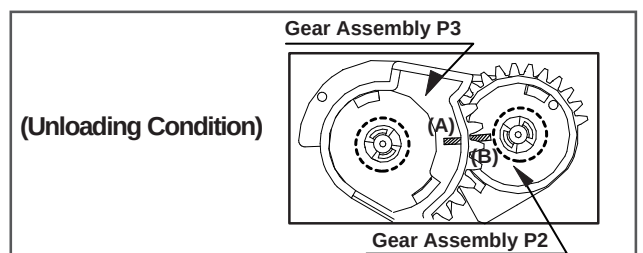
- 1) Unhook the Hook(H3) and push down the Arm Assembly Idler Jog.

NOTE

- 1) Arm Assembly Idler is for Normal Models.
- 2) Arm Assembly Idler Jog is for Jog Shuttle Models.

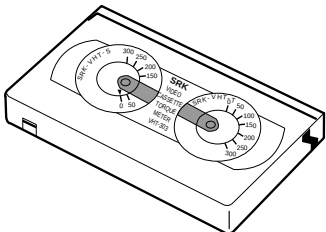
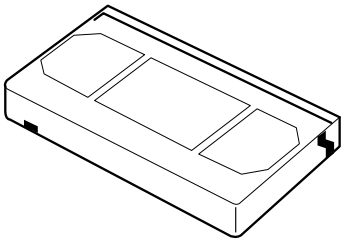
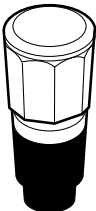
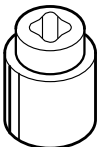
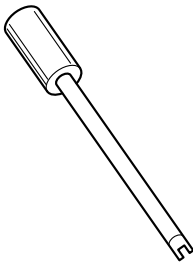
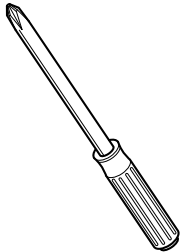
NOTE

- 1) When reassembling, confirm that the (A) Part of the Gear Assembly P3 is aligned to the (B) Part of the Gear Assembly P2 as shown below.



DECK MECHANISM DISASSEMBLY

• Tools and Fixfures for Service

1. Cassette Torque meter SRK-VHT-303(Not SVC part) Parts No: D00-D006 	2. Alignment tape Parts No NTSC: DTN-001 PAL:DTN-0002 	3. Torque gauge 600g.Cm ATG Parts No:D00-D002 
4. Torque gauge adaptor Parts No:D09-R001 	5. Post height adjusting driver Parts No:DTL-0005 	6. + Type driver (ø 5) 

DECK MECHANISM ADJUSTMENT(FOR NORMAL MODELS)

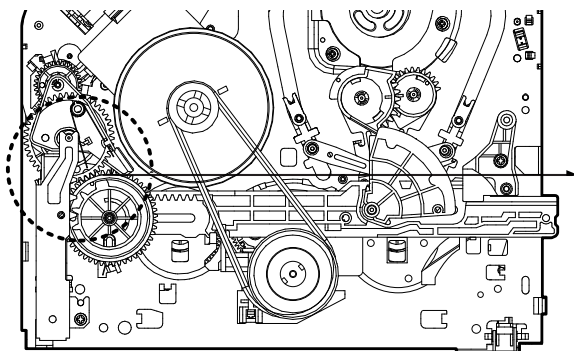
1.Mechanism Alignment Position Check

Purpose:To determine if the Mechanism is in the correct position, when a Tape is ejected.

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Check Point
• Blank tape	• Eject Mode (with Cassette ejected)	• Mechanism and Mode Switch Position

- 1) Turn the Power S/W on and eject the Cassette by pressing the Eject Button.
- 2) Remove the Top Cover and Plate Assembly Top, visually check if the Gear Cam Hole is aligned with the Chassis Hole as below Fig. C-2.
- 3) IF not, rotate the Shaft of the Loading Motor to either Clockwise or Counterclockwise until the Alignment is as below Fig. C-2.
- 4) Remove the Screw which fixes the Deck Mechanism and Main Frame and confirm if the Gear Cam is aligned with the Gear Drive as below Fig. C-1(A).
- 5) Confirm if the Mode S/W on the Main P.C.Board is aligned as below Fig. C-1(B).
- 6) Remount the Deck Mechanism on the Main P.C.Board and check each operation.

CHECK DIAGRAM



BOTTOM VIEW

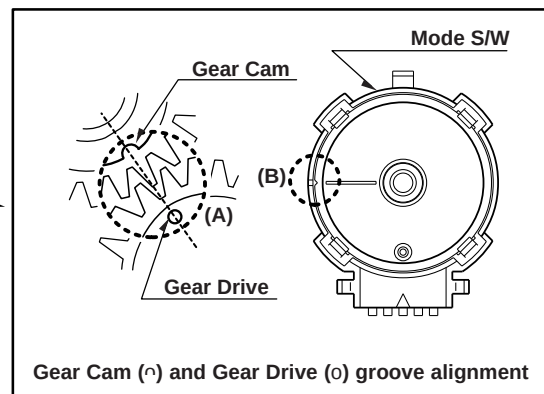
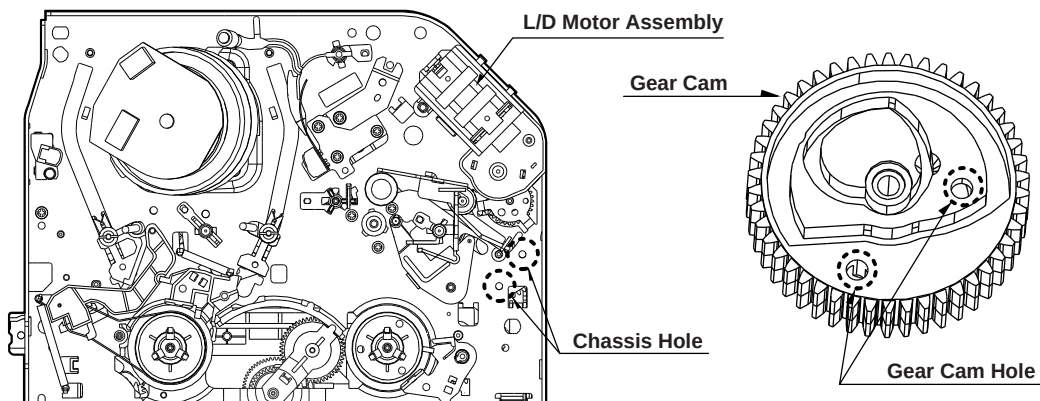


Fig. C-1



TOP VIEW

Fig. C-2

DECK MECHANISM ADJUSTMENT (FOR JOG SHUTTLE MODELS)

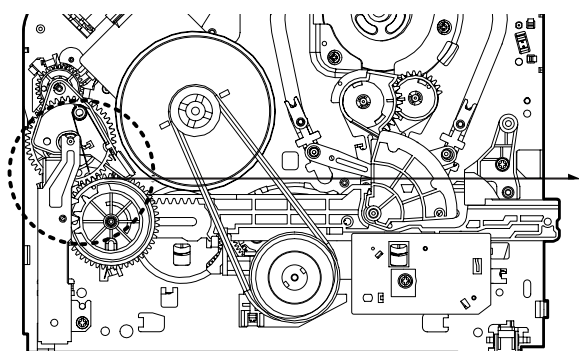
1. Mechanism Alignment Position Check

Purpose: To determine if the Mechanism is in the correct position, when a Tape is ejected.

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Check Point
• Blank tape	• Eject Mode (with Cassette ejected)	• Mechanism and Mode Switch Position

- 1) Turn the Power S/W on and eject the Cassette by pressing the Eject Button.
- 2) Remove the Top Cover and Plate Assembly Top, visually check if the Gear Cam Hole is aligned with the Chassis Hole as below Fig. C-2.
- 3) IF not, rotate the Shaft of the Loading Motor to either Clockwise or Counterclockwise until the Alignment is as below Fig. C-2.
- 4) Remove the Screw which fixes the Deck Mechanism and Main Frame and confirm if the Gear Cam is aligned with the Gear Drive as below Fig. C-1(A).
- 5) Confirm if the Mode S/W on the Main P.C.Board is aligned as below Fig. C-1(B).
- 6) Remount the Deck Mechanism on the Main P.C.Board and check each operation.

CHECK DIAGRAM



BOTTOM VIEW

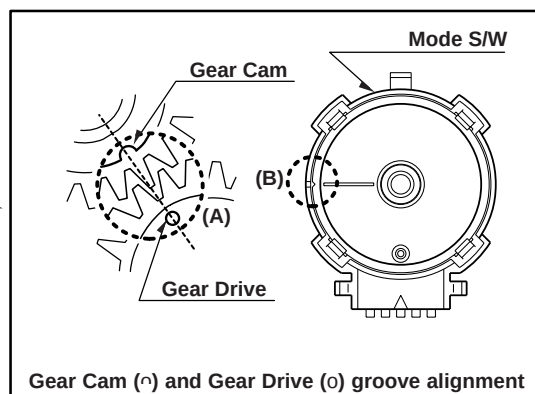
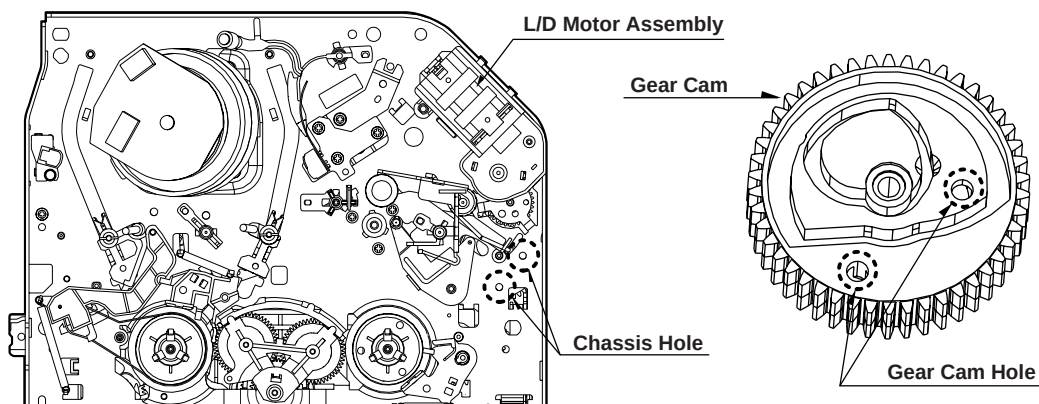


Fig. C-1



TOP VIEW

Fig. C-2

DECK MECHANISM ADJUSTMENT

2. Preparation for Adjustment (To set the Deck Mechanism to the Loading state without inserting a Cassette Tape).

- 1) Unplug the Power Cord from the AC Outlet.
- 2) Disassemble the Top Cover and Plate Assembly Top.
- 3) Plug the Power Cord into the AC Outlet.
- 4) Turn the Power S/W on and push the Lever Stopper (L),(R) of the Holder Assembly CST to the back for

Loading the Cassette without Tape.

Cover the Holes of the End Sensors at the both sides of the Bracket Side(L) and Bracket Assembly Door to prevent a light leak.

Then The Deck Mechanism drives to the Stop Mode. In this case, The Deck Mechanism can accept inputs of each mode, however the Rewind and Review Operation can not be performed for more than a few seconds because the Take-up Reel Table is in the Stop State and can not be detected the Reel Pulses.

3. Checking Torque

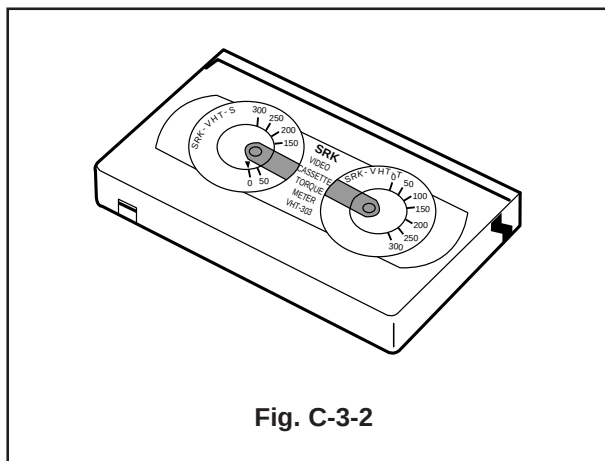
Purpose: To insure smooth Transport of the Tape during each Mode of Operation.
If the Tape Transport is abnormal, then check the Torque as indicated by the chart below.

Test Equipment/ Fixture		Test Conditions (Mechanism Condition)	Checking Method	
• Torque Gauge(600g/cm ATG) • Torque Gauge Adaptor • Cassette Torque Meter SRK-VHT-303		• Play (FF) or Review (REW) Mode	• Perform each Deck Mechanism Mode without inserting a Cassette Tape(Refer to above No.2 Preparation for Adjustment). • Read the Measurement of the Take-up or Supply Reels on the Cassette Torque Meter(Fig. C-3-2). • Attach the Torque Gauge Adaptor to the Torque Gauge and then read the Value of it(Fig. C-3-1).	
Item	Mode	Test Equipment	Measurement Reel	Measurement Values
Fast Forward Torque	Fast Forward	Cassette Torque Gauge	Take-Up Reel	More than 400g/cm
Rewind Torque	Rewind	Cassette Torque Gauge	Supply Reel	More than 400g/cm
Play Take-Up Torque	Play	Cassette Torque Meter	Take-Up Reel	70~120g/cm
Review Torque	Review	Cassette Torque Meter	Supply Reel	130~210g/m

NOTE:

The Values are measured by using a Torque Gauge and Torque Gauge Adaptor with the Torque Gauge affixed.

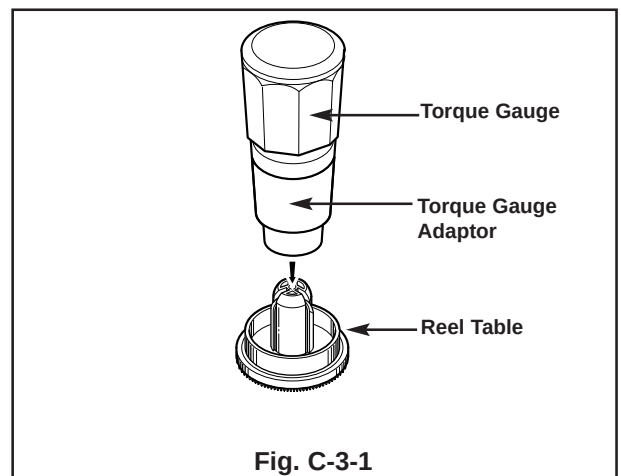
• Cassette Torque Meter (SRK-VHT-303)



NOTE:

The Torque reading to measure occurs when the Tape abruptly changes direction from Fast Forward of Rewind Mode, when quick bracking is applied to both Reels.

• Torque Gauge (600g.cm ATG)



DECK MECHANISM ADJUSTMENT

4. Guide Roller Height Adjustment

Purpose: To regulate the Height of the Tape so that the Bottom of the Tape runs along the Tape Guide Line on the Lower Drum.

4-1. Preliminary Adjustment

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Adjustment Point
• Post Height Adjusting Driver	• Play or Review Mode	• Guide Roller Height Adjustment screws on the Supply and Take-Up Guide Rollers.

Adjustment Procedure

- 1) Confirm if the Tape runs along the Tape Guide Line of the Lower Drum.
- 2) If the Tape runs the Bottom of the Guide Line, turn the Guide Roller Height Adjustment Screw to Clockwise direction.
- 3) If it runs the Top, turn to Counterclockwise direction.
- 4) Adjust the Height of the Guide Roller to be guided to the Guide Line of the Lower Drum from the Starting and Ending Point of the Drum.

ADJUSTMENT DIAGRAM

Fig. C-4-1

4-2. Precise Adjustment

Test Equipment/Fixture	Test Equipment Connection Points	Test Conditions VCR(VCP) State	Adjustment Point
• Oscilloscope • Alignment Tape • Post Height Adjusting Driver	• CH-1:PB RF Envelope • CH-2:NTSC: SW 30Hz PAL: SW 25Hz • Head Switching Output Point • RF Envelope Output Point	• Play an Alignment Tape	• Guide Roller Height Adjustment Screws

Adjustment Procedure

- 1) Play an Alignment Tape after connecting the Probe of the Oscilloscope to the RF Envelope Output Test Point and Head Switching Output Test Point.
- 2) Tracking Control(in PB Mode) : Center Position(When this Adjustment is performed after the Drum Assembly has been replaced, set the Tracking Control so that the RF Output is Maximum).
- 3) Height Adjustment Screw : Flatten the RF Waveform. (Fig. C-4-2)
- 4) Turn(Move) the Tracking Control(in PB Mode) Clockwise and Counterclockwise.(Fig. C-4-3)
- 5) Check that any Drop of RF Output is uniform at the Start and End of the Waveform.

NOTE

If the adjustment is excessive or insufficient the tape will jam or fold.

Waveform Diagrams

P2 POST ADJUSTMENT

P3 POST ADJUSTMENT

Turn the Roller Guide Height Adjustment Screw slightly to flatten the waveform.

Fig. C-4-2

Tracking control at center

Turn(Move) the tracking control to both directions

Fig. C-4-3

Connection Diagram

DECK MECHANISM ADJUSTMENT

5. Audio/Control (A/C) Head Adjustment

Purpose: To insure that the Tape passes accurately over the Audio and Control Tracks in exact Alignment in both the Record and Playback Modes.

5-1. Preliminary Adjustment (Height and Tilt Adjustment)

Perform the Preliminary Adjustment, when there is no Audio Output Signal with the Alignment Tape.

Test Equipment/ Fixture	Test Conditions (Mechanism Condition)	Adjustment Point
• Blank Tape • Screw Driver(+) Type 5mm	• Play the blank tape	• Tilt Adjustment Screw(C) • Height Adjustment Screw(B) • Azimuth Adjustment Screw(A)

Adjustment Procedure/Diagrams

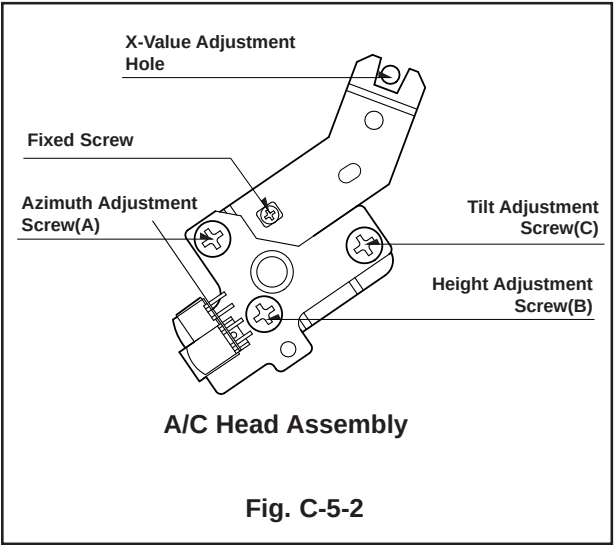
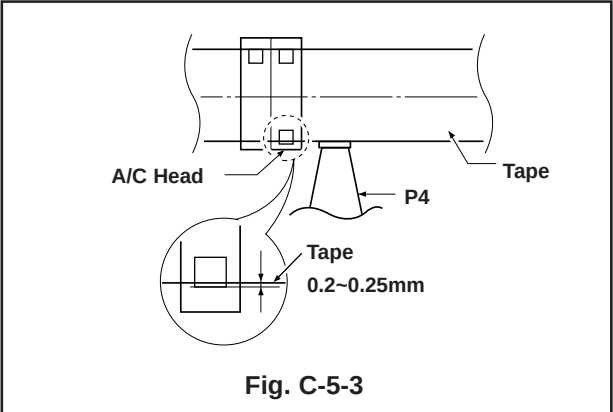
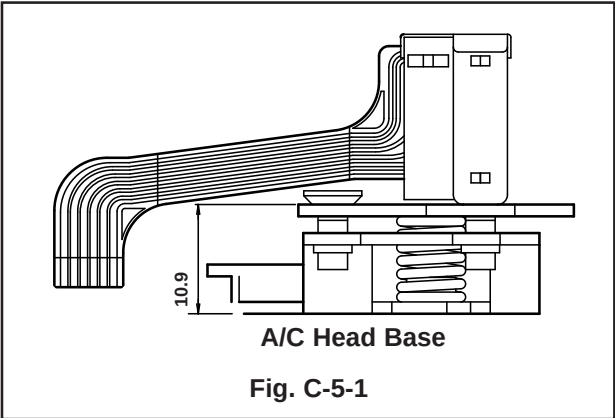
- 1) Initially adjust the Base Assembly A/C Head as shown Fig. C-5-1 by using the Height Adjustment Screw(B).

2) Play a Blank Tape and observe if the Tape passes accurately over the A/C Head without Tape Curling or Folding.

3) If Folding or Curling is occurred then adjust the Tilt Adjustment Screw(C) while the Tape is running to resemble Fig. C-5-3.
- 4) Reconfirm the Tape Path after Playback about 4~5 seconds.

NOTE

Ideal A/C head height occurs, when the tape runs between 0.2~0.25mm above the bottom edge of the A/C head core.



DECK MECHANISM ADJUSTMENT

5-2. Confirm that the Tape passes smoothly between the Take-up Guide and Pinch Roller(using a Mirror or the naked eye).

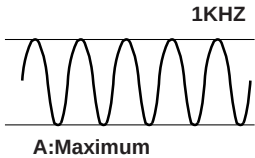
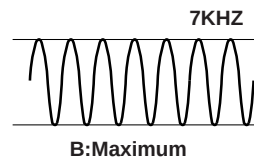
- 1) After completing Step 5-1.(Preliminary Adjustment), check that the Tape passes around the Take-up Guide and Pinch Roller without Folding or Curling at the Top or Bottom.
 - (1) If Folding or Curling is observed at the Bottom of the Take-up Guide then slowly turn the Tilt Adjustment Screw(C) in the Clockwise direction.
 - (2) If Folding or Curling is observed at the Top of it then

slowly turn the Tilt Adjustment Screw(C) in the Counterclockwise direction.

NOTE:

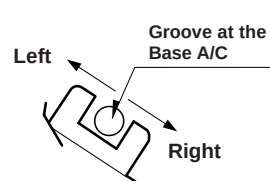
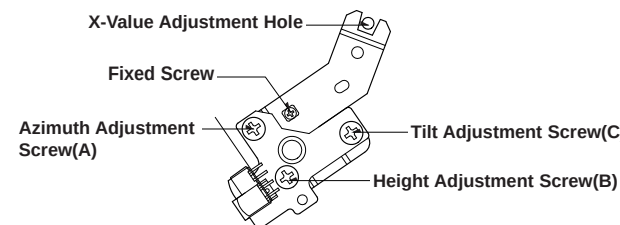
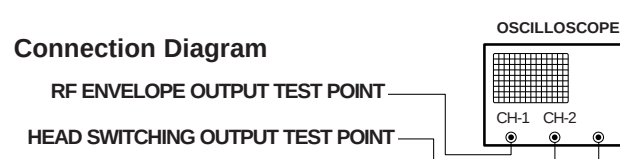
Check the RF Envelope after adjusting the A/C Head, if the RF Waveform differs from Fig. C-5-4, performs Precise Adjustment to flat the RF Waveform.

5-3. Precise Adjustment (Azimuth adjustment)

Test Equipment/ Fixture	Connection Point	Test Conditions (Mechanism Condition)	Adjustment Point
- Oscilloscope - Alignment Tape(SP) - Screw Driver(+) Type 5mm	Audio output jack	Play an Alignment Tape 1KHz, 7KHz Sections	- Azimuth Adjustment Screw(A) - Height Adjustment Screw(B)
Adjustment Procedure - Connect the Probe of the Oscilloscope to Audio Output Jack. - Alternately adjust the Azimuth Adjustment Screw(A) and the Tilt Adjustment Screw(C) for Maximum Output of the 1Khz and 7Khz segments, while maintaining the flattest Envelope differential between the two Frequencies.			
			
Fig. C-5-4			

6. X-Value Adjustment

Purpose: To obtain compatibility with other VCR(VCP) Models.

Test Equipment/ Fixture	Connection Point	Test Conditions (Mechanism Condition)	Adjustment Point
- Oscilloscope - Alignment tape(SP only) - Screw Driver(+) Type 5mm	- CH-1: PB RF Envelope - CH-2: NTSC: SW 30Hz PAL: SW 25Hz - Head Switching Output Test Point - RF Envelope Output Test Point	Play an Alignment Tape	
Adjustment Procedure - Release the Automatic Tracking to run long enough for Tracking to complete it's Cycle. - Loosen the Fixed Mounting Screw and move the Base Assembly A/C Head in the direction as shown in the Diagram to find the center of the peak that allows for the maximum Waveform Envelope. This method should allow the 31um Head to be centrally located over the 58um Tape Track. - Tighten the Base Assembly A/C Head mounting Screw.		Adjustment Diagram 	
		Connection Diagram 	

DECK MECHANISM ADJUSTMENT

7. Adjustment after Replacing Drum Assembly (Video Heads)

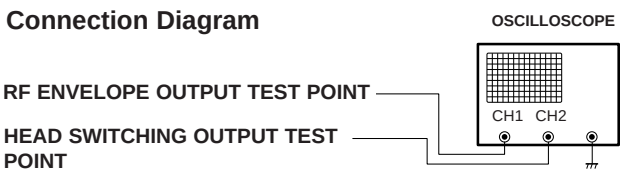
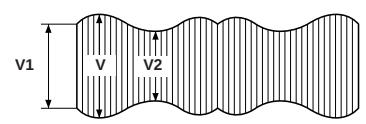
Purpose: To correct for shift in the Roller Guide and X value after replacing the Drum.			
Test Equipment/ Fixture	Connection Point	Test Conditions (Mechanism Condition)	Adjustment Points
- Oscilloscope - Alignment tapes - Blank Tape - Post Height Adjusting Driver - Screw Driver(+) Type 5mm	- CH-1: PB RF Envelope - CH-2: NTSC: SW 30Hz PAL: SW 25Hz - Head Switching Output Test Point - RF Envelope Output Test Point	- Play the blank tape - Play an alignment tape	- Guide Roller Precise Adjustment - Switching Point - Tracking Preset - X-Value
Checking/Adjustment Procedure Play a blank tape and check for tape curling or creasing around the roller guide. If there is a problem then follow the procedure 4. "Guide Roller Height" and 5. "Audio Control(A/C) Head Adjustment".		Connection Diagram  Waveform $V1/V \text{ MAX} \leq 0.7$ $V2/V \text{ MAX} \leq 0.8$ RF ENVELOPE OUTPUT 	

Fig. C-7

8. Check the Tape Travel after Reassembling Deck Assembly.

8-1.Check Audio and RF Locking Time during playback and after CUE or REV (FF/REW)

Test Equipment/ Fixture	Specification	Connection Points	Test Conditions (Mechanism Condition)
- Oscilloscope - Alignment tapes(with 6H 3kHz Color Bar Signal) - Stop Watch	- RF Locking Time: Less than 5 sec. - Audio Locking Time:Less than 10sec	- CH-1: PB RF Envelope - CH-2: Audio Output - RF Envelope Output Point - Audio Output Jack	Play an alignment tape (with 6H 3kHz Color Bar Signal)
Checking Procedure Play an alignment tape then change the operating mode to CUE or REV and confirm if the unit meets the above listed specifications.		NOTES: 1) CUE is fast forward mode (FF) 2) REV is the rewind mode (REW) 3) Referenced to the Play mode	

8-2.Check for tape curling or jamming

Test Equipment/ Fixture	Specification	Test Conditions (Mechanism Condition)
- T-160 Tape - T-120 Tape	Be sure there is no tape jamming or curling at the beginning, middle or end of the tape.	Run the CUE, REV play mode at the beginning and the end of the tape.
Checking Procedure 1) Confirm that the tape runs smoothly around the roller guides, drum and A/C head assemblies while abruptly changing operating modes from Play to CUE or REV. This is to be checked at the beginning, middle and end sections of the cassette. 2) Confirm that the tape passes over the A/C head assembly as indicated by proper audio reproduction and proper tape counter performance.		

MAINTENANCE/INSPECTION PROCEDURE(FOR NORMAL MODELS)

1 Check before starting repairs

The following faults can be remedied by cleaning and oiling. Check the needed lubrication and the conditions of cleanliness in the unit.

Check with the customer to find out how often the unit is used, and then determine that the unit is ready for inspection and maintenance. Check the following parts.

Phenomenon	Inspection	Replacement	
Color beats	Dirt on full-erase head	o	F/E Head
Poor S/N, no color	Dirt on video head	o	Video Head
Vertical or Horizontal jitter	Dirt on video head Dirt on tape transport system	o	
Low volume, Sound distorted	Dirt on Audio/control head	o	A/C Head
Tape does not run. Tape is slack	Dirt on pinch roller	o	Pinch Roller
	Dirt on pinch roller	o	Belt Capston
In Review and Unloading (off mode), the Tape is rolled up loosely.	Clutch Assembly D33K Torque reduced	o	Clutch Assembly D33K
	Cleaning Drum and transport system	Fig. C-9-3	

NOTE

If locations marked with o do not operate normally after cleaning, check for wear and replace.

See the EXPLODED VIEWS at the end of this manual as well as the above illustrations See the Greasing (Page 4-22) for the sections to be lubricated and greased.

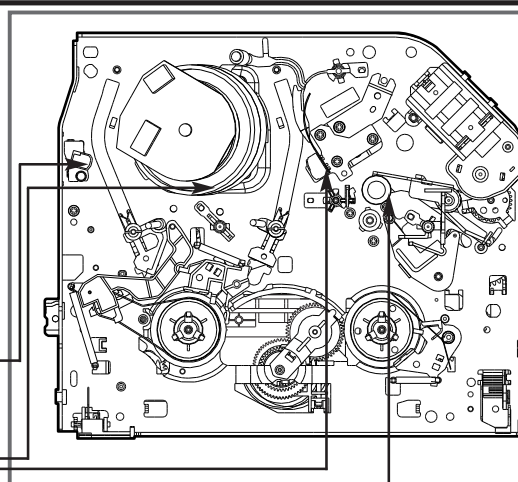


Fig. C-9-1 Top VIEW

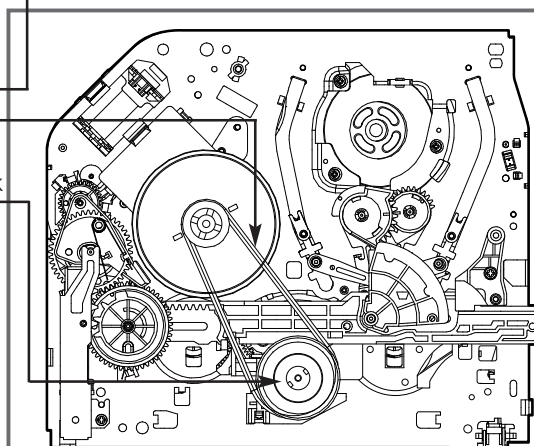


Fig. C-9-2 BOTTOM VIEW

* No. (1)~(13) Indicates the Tape Path to be traveled from Supply Reel to Take-up Reel.

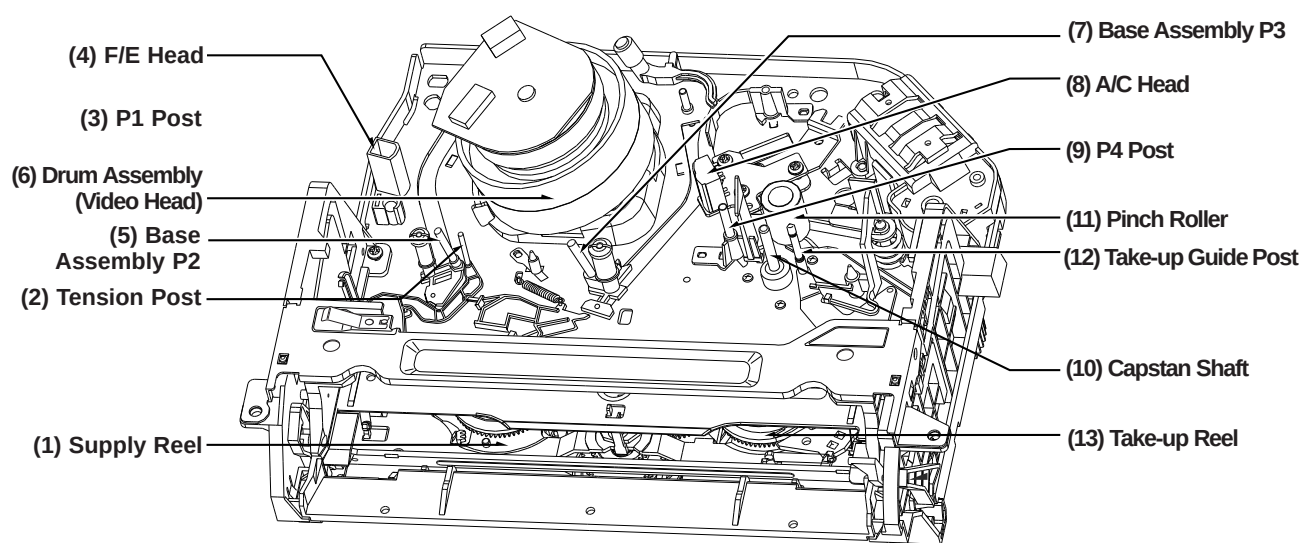


Fig. C-9-3 Tape Transport System

MAINTENANCE/INSPECTION PROCEDURE(FOR JOG SHUTTLE MODELS)

1 Check before starting repairs

The following faults can be remedied by cleaning and oiling. Check the needed lubrication and the conditions of cleanliness in the unit.

Check with the customer to find out how often the unit is used, and then determine that the unit is ready for inspection and maintenance. Check the following parts.

Phenomenon	Inspection	Replacement
Color beats	Dirt on full-erase head	o
Poor S/N, no color	Dirt on video head	o
Vertical or Horizontal jitter	Dirt on video head Dirt on tape transport system	o
Low volume, Sound distorted	Dirt on Audio/control head	o
Tape does not run. Tape is slack	Dirt on pinch roller	o
In Review and Unloading (off mode), the Tape is rolled up loosely.	Clutch Assembly D33K Torque reduced	o
	Cleaning Drum and transport system	Fig. C-9-3

NOTE

If locations marked with o do not operate normally after cleaning, check for wear and replace.

See the EXPLODED VIEWS at the end of this manual as well as the above illustrations See the Greasing (Page 4-22) for the sections to be lubricated and greased.

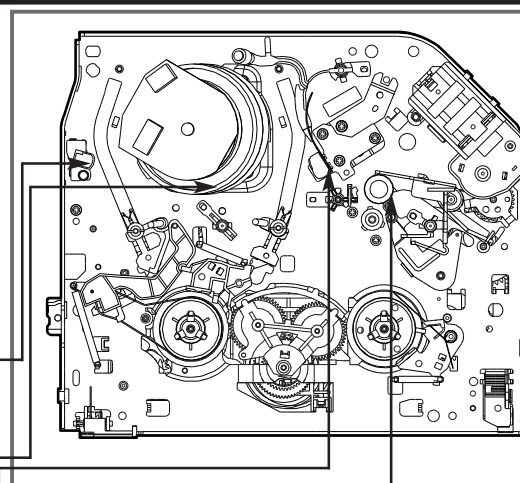


Fig. C-9-1 Top VIEW

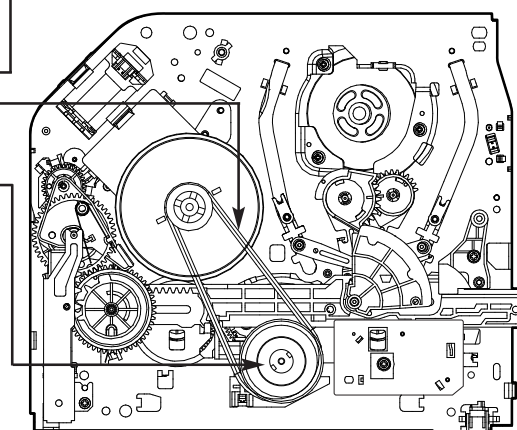


Fig. C-9-2 BOTTOM VIEW

* No. (1)~(13) Indicates the Tape Path to be traveled from Supply Reel to Take-up Reel.

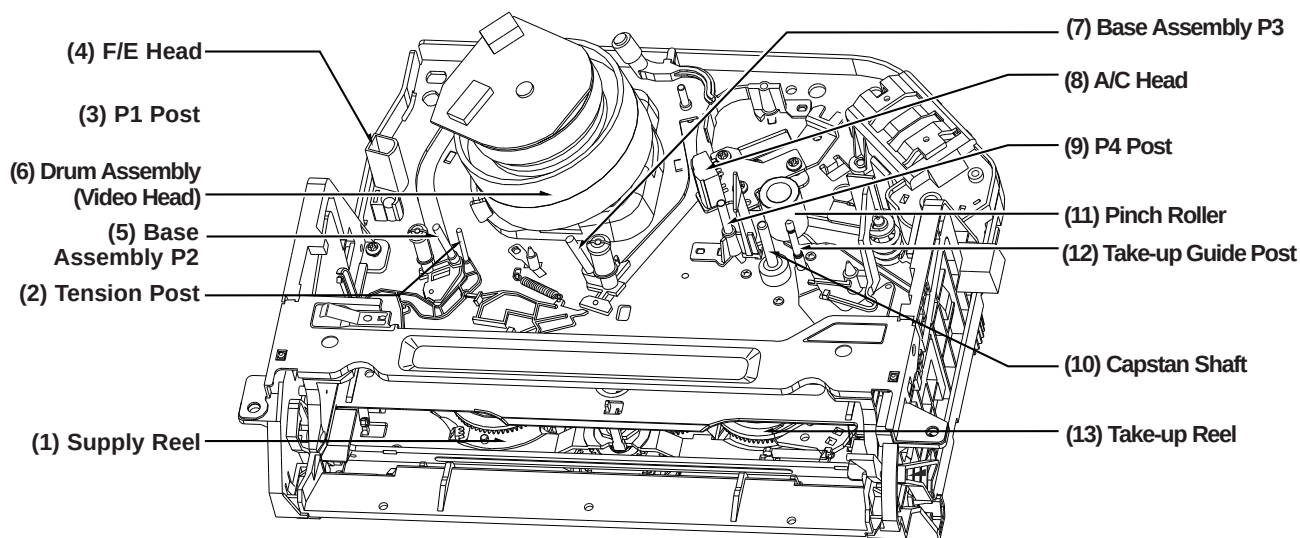


Fig. C-9-3 Tape Transport System

MAINTENANCE/INSPECTION PROCEDURE

2. Required Maintenance

The recording density of a VCR(VCP) is much higher than that of an audio tape recorder. VCR(VCP) components must be very precise, at tolerances of 1/1000mm, to ensure compatibility with other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective. To ensure a good picture, periodic inspection and maintenance, including replacement of worn out parts and lubrication, is necessary.

3. Scheduled Maintenance

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR(VCP), and the environment in which the VCR(VCP) is used.

But, in general home use, a good picture will be maintained if inspection and maintenance is made every 1,000 hours. The table below shows the relation between time used and inspection period.

Table 1

When inspection is necessary Average hours used per day	About 1 year	About 18 months	About 3 years
One hour			
Two hours			
Three hours			

4. Supplies Required for Inspection and Maintenance

- (1) Grease : Kanto G-311G (Blue) or equivalent
- (2) Isopropyl Alcohol or equivalent
- (3) Cleaning Patches
- (4) Grease : Kanto G-381(Yellow) : Used only for Reel S and Reel T

5) Maintenance Procedure

5-1) Cleaning

- (1) Cleaning video head

First use a cleaning tape. If the dirt on the head is too stubborn to remove by tape, use the cleaning patch. Coat the cleaning patch with Isopropyl Alcohol. Touch the cleaning patch to the head tip and gently turn the head(rotating cylinder) right and left.

(Do not move the cleaning patch vertically. Make sure that only the buckskin on the cleaning patch comes into contact with the head. Otherwise, the head may be damaged.)

Thoroughly dry the head. Then run the test tape. If Isopropyl Alcohol remains on the video head, the tape may be damaged when it comes into contact with the head surface.

- (2) Clean the tape transport system and drive system, etc, by wiping with a cleaning patch wetted with Isopropyl Alcohol.

NOTES:

- ① It is the tape transport system which comes into contact with the running tape. The drive system consists of those parts which moves the tape.
- ② Make sure that during cleaning you do not touch the tape transport system with the tip of a screw driver and no that force is that would cause deforming or damage applied to the system.

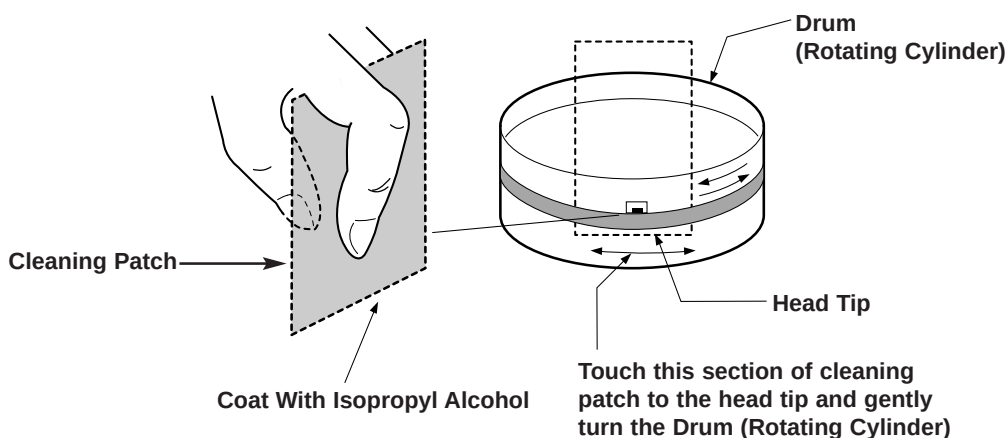


Fig. C-9-4

MAINTENANCE/INSPECTION PROCEDURE

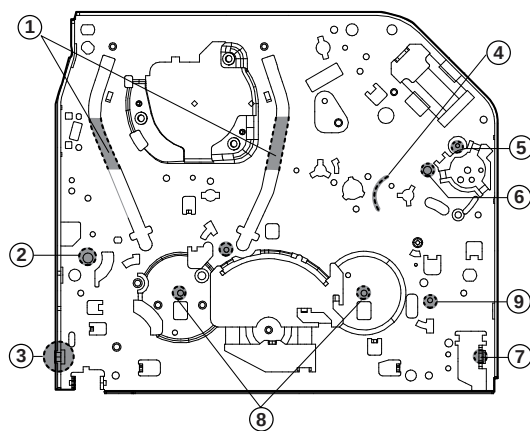
5-2) Greasing

(1) Greasing guidelines

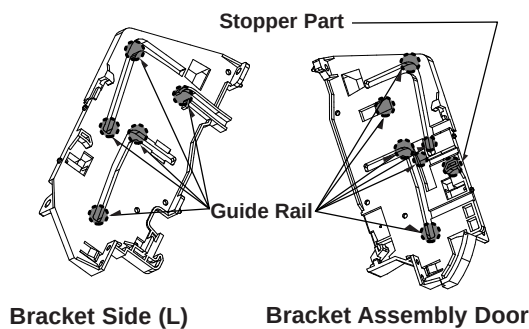
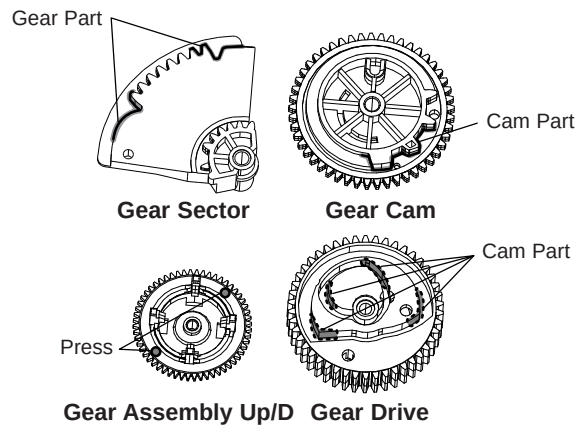
Apply grease, with a cleaning patch. Do not use excess grease. It may come into contact with the tape transport or drive system. Wipe any excess and clean with cleaning patch wetted in Isopropyl Alcohol.

NOTE: Greasing Points

- | | |
|-----------------------------------|---|
| 1) Loading Path Inside & Top side | 6) Shaft |
| 2) Base Tension Boss inside Hole | 7) Arm Assembly F/L of Buming Inside Hole |
| 3) Arm Assembly F/L "U" Groove | 8) Reel S, T Shaft (G381: Yellow) |
| 4) Arm Take-up Rubbing Section | 9) Brake T Groove |
| 5) L/D Motor Worm Wheel Part | |



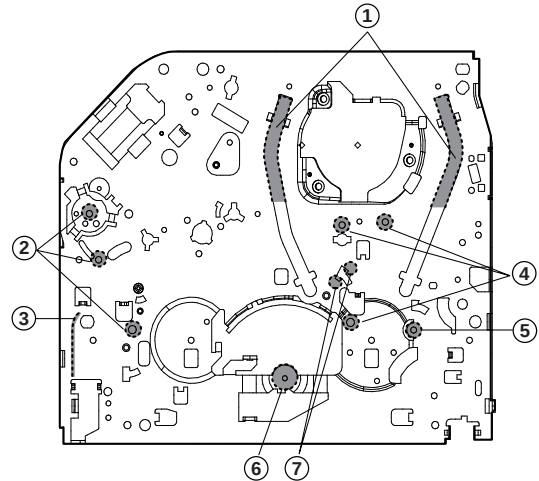
Chassis (Top)



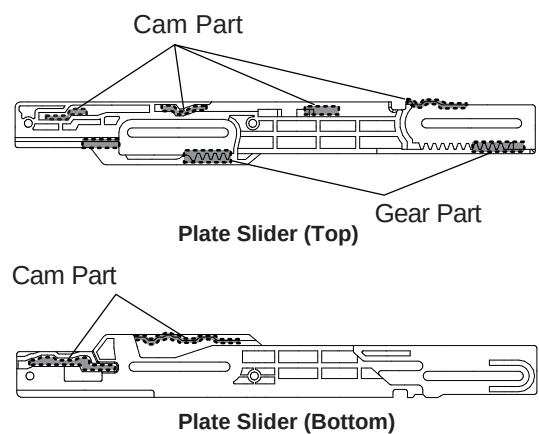
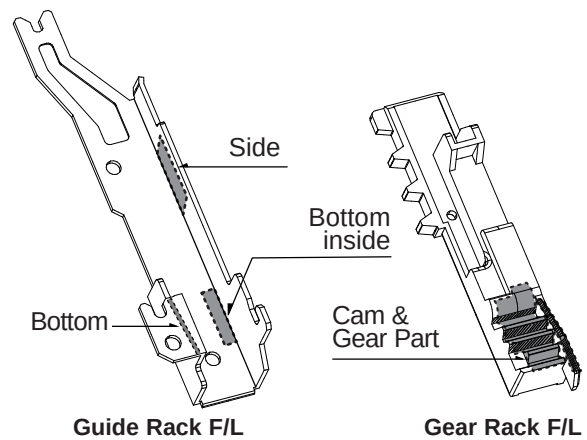
(2) Periodic greasing

Grease specified locations every 5,000 hours.

- | | |
|-----------------------------------|------------------------------|
| 1) Loading Path Inside & Top side | 5) Lever Tension Groove |
| 2) Shaft | 6) Clutch Assembly D33 Shaft |
| 3) Gear Rack F/L Moving Section | 7) Brake "S" Rubbing Section |
| 4) Shaft | |



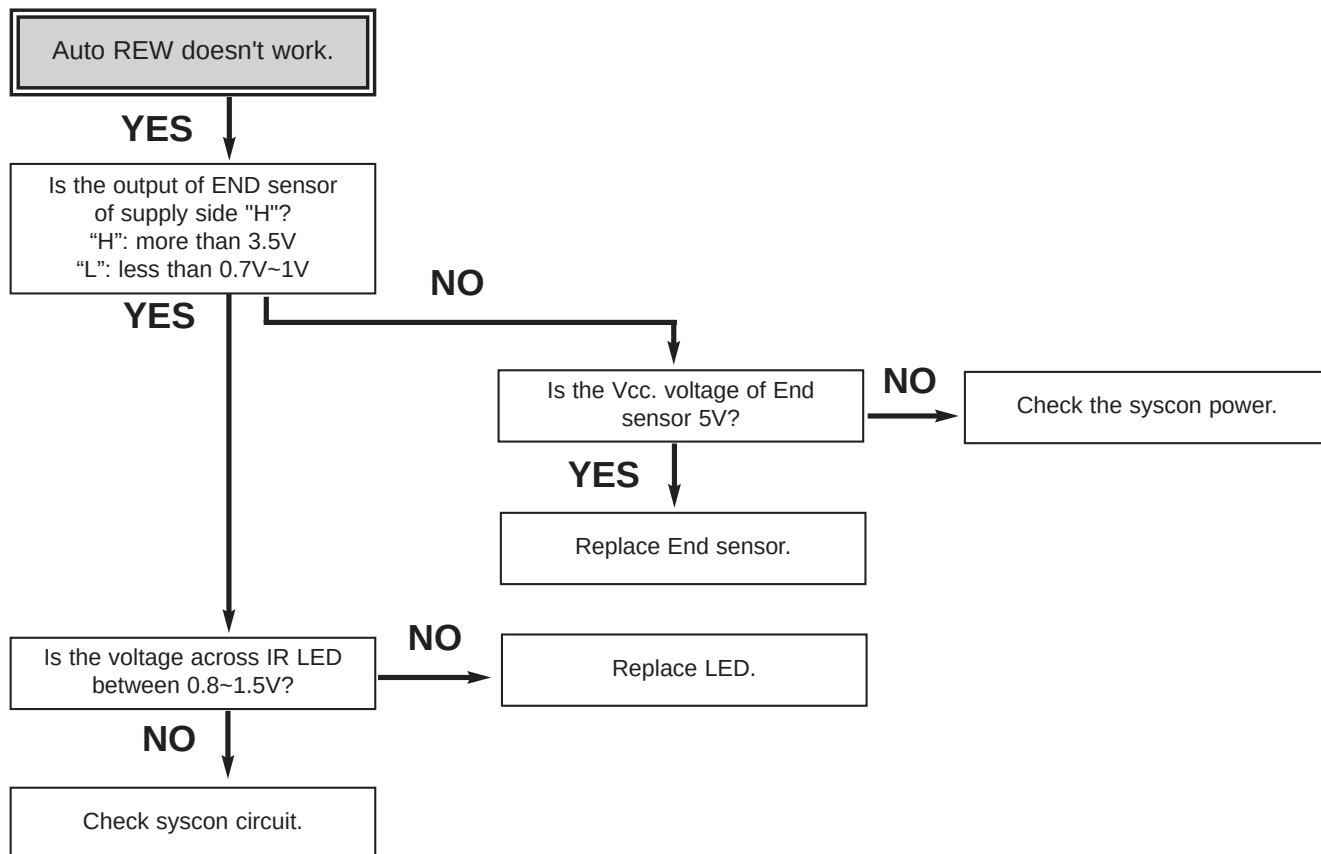
Chassis (Bottom)



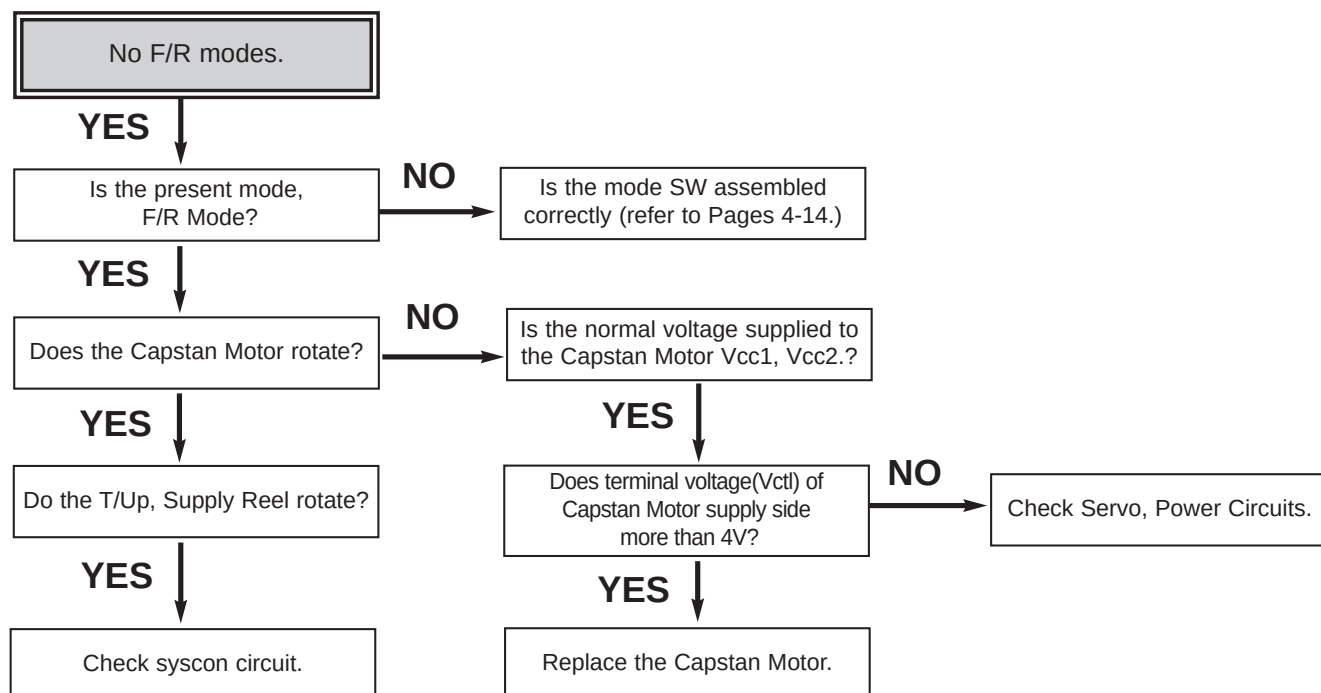
MECHANISM TROUBLESHOOTING GUIDE

1. Deck Mechanism

A.

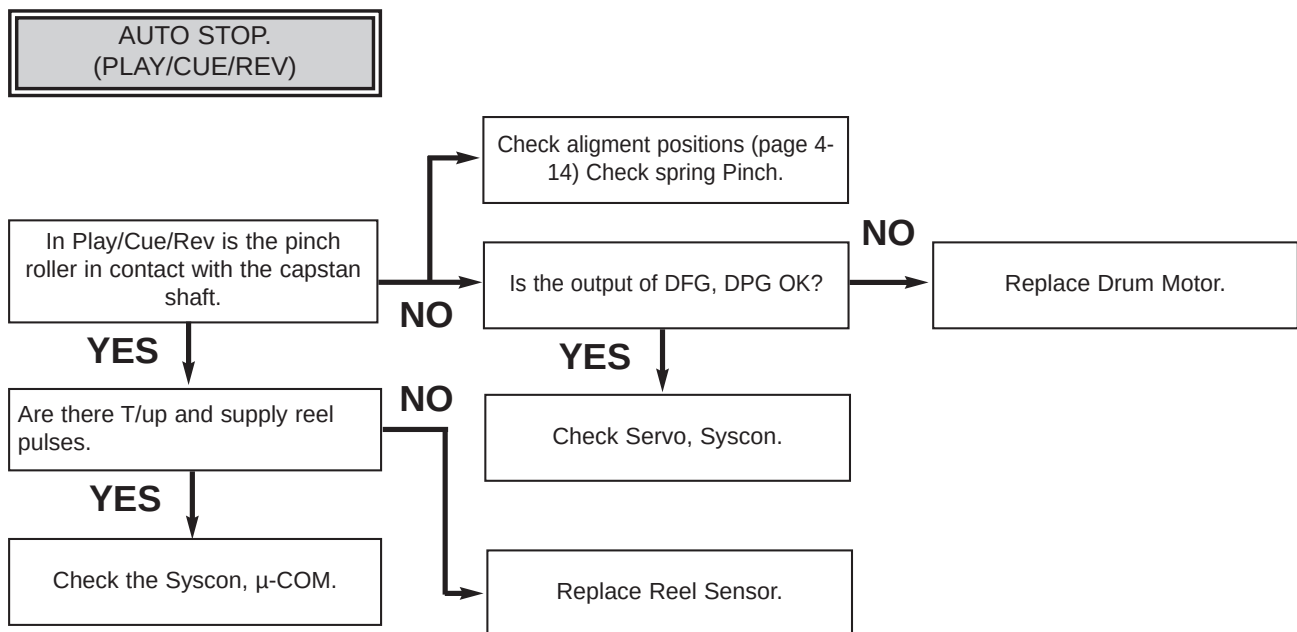


B.

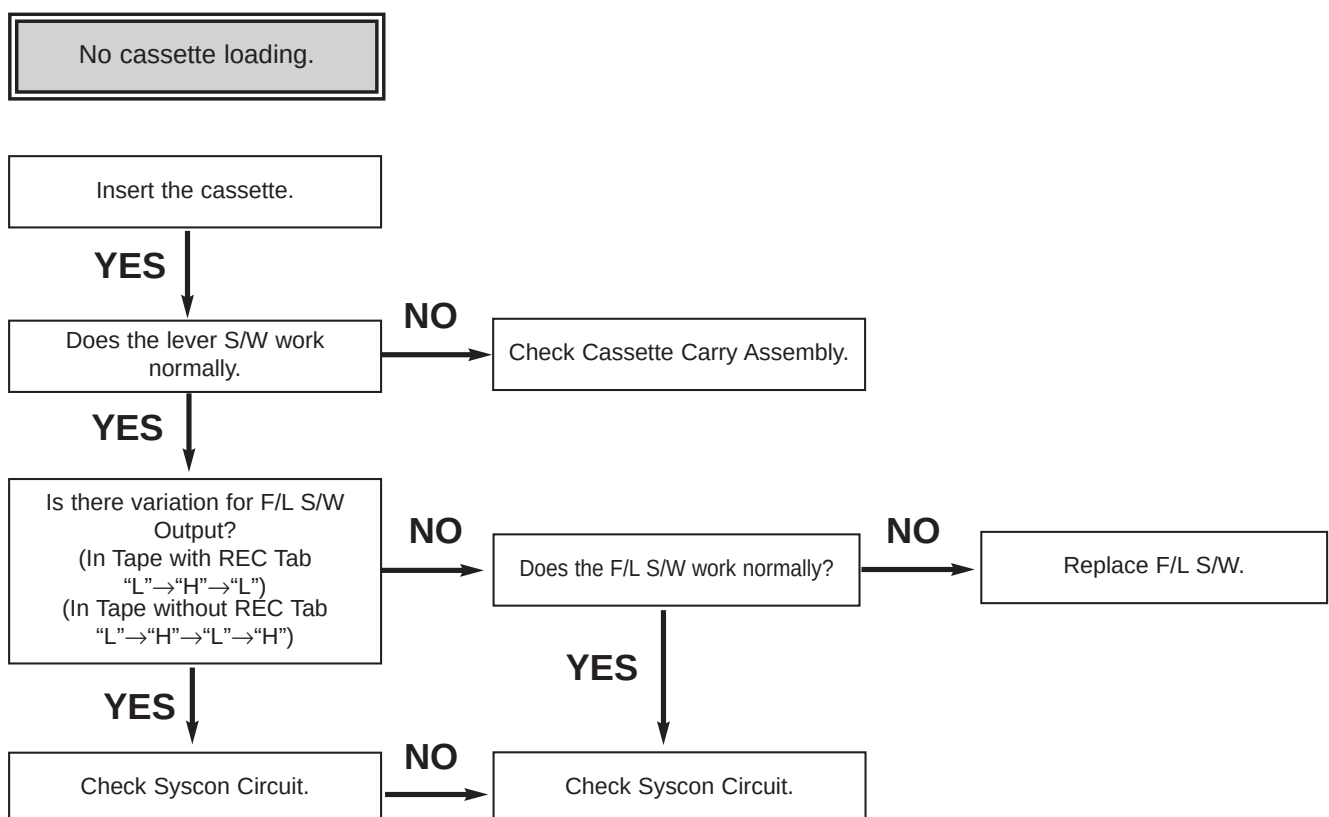


MECHANISM TROUBLESHOOTING GUIDE

C.

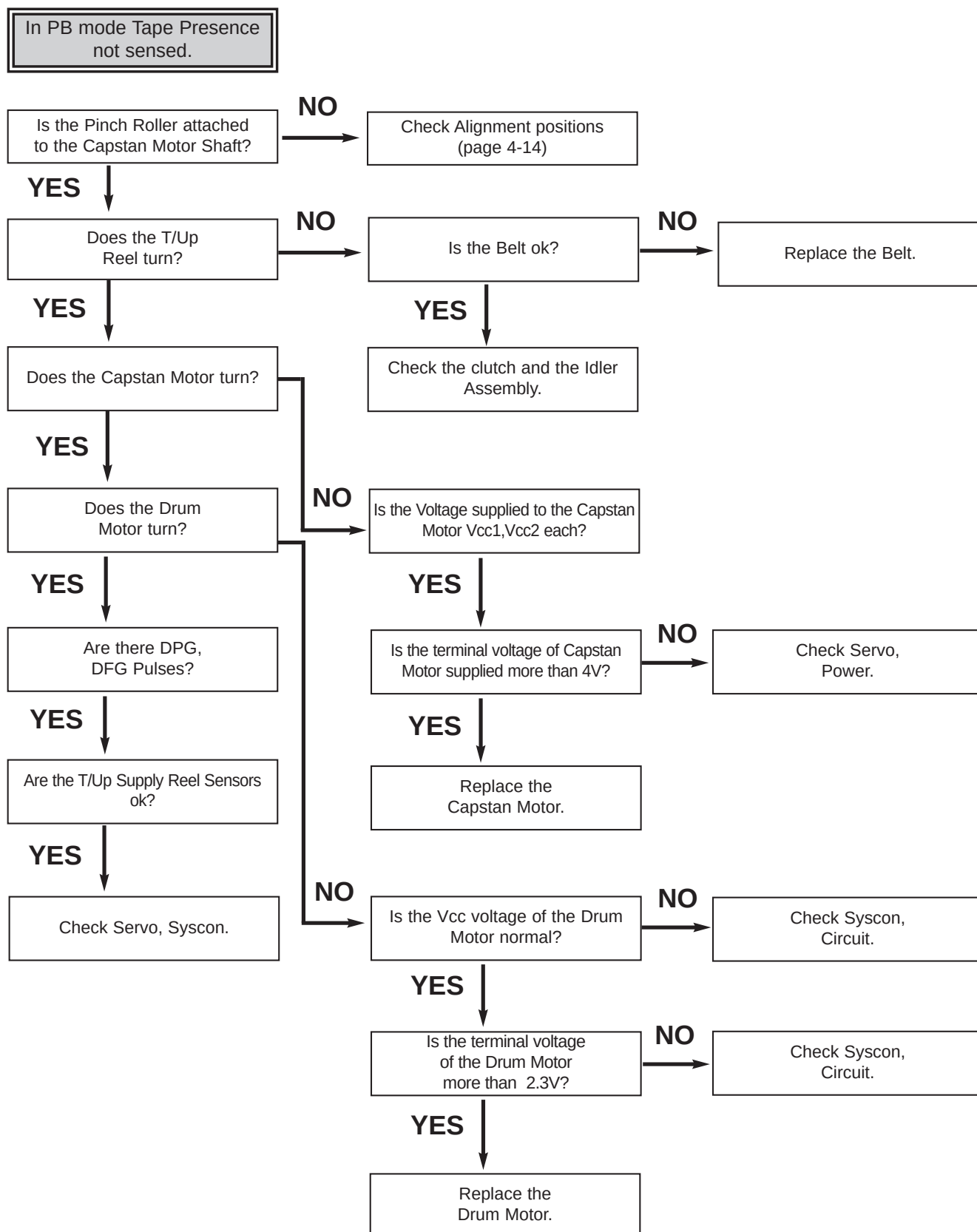


D.



MECHANISM TROUBLESHOOTING GUIDE

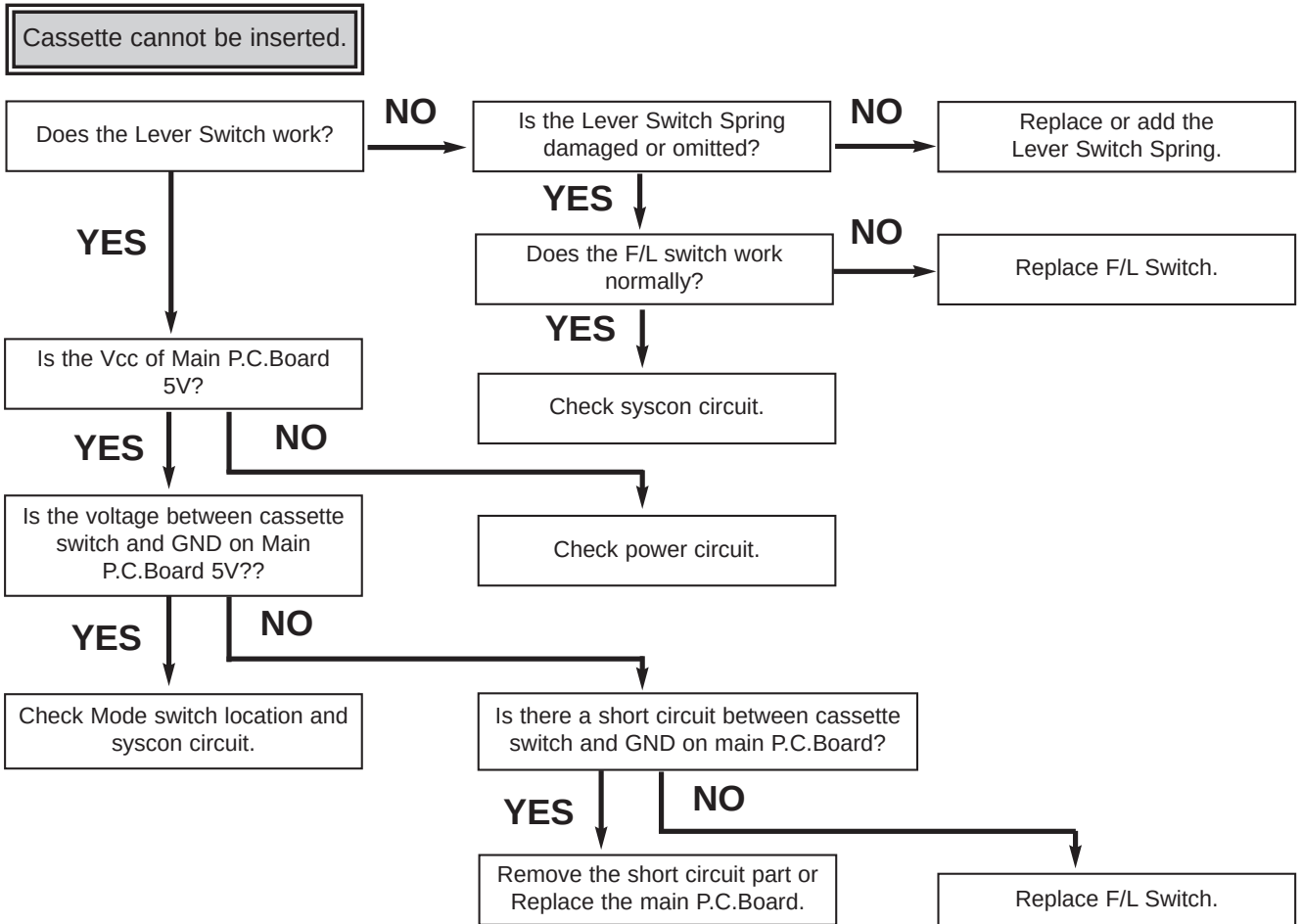
E.



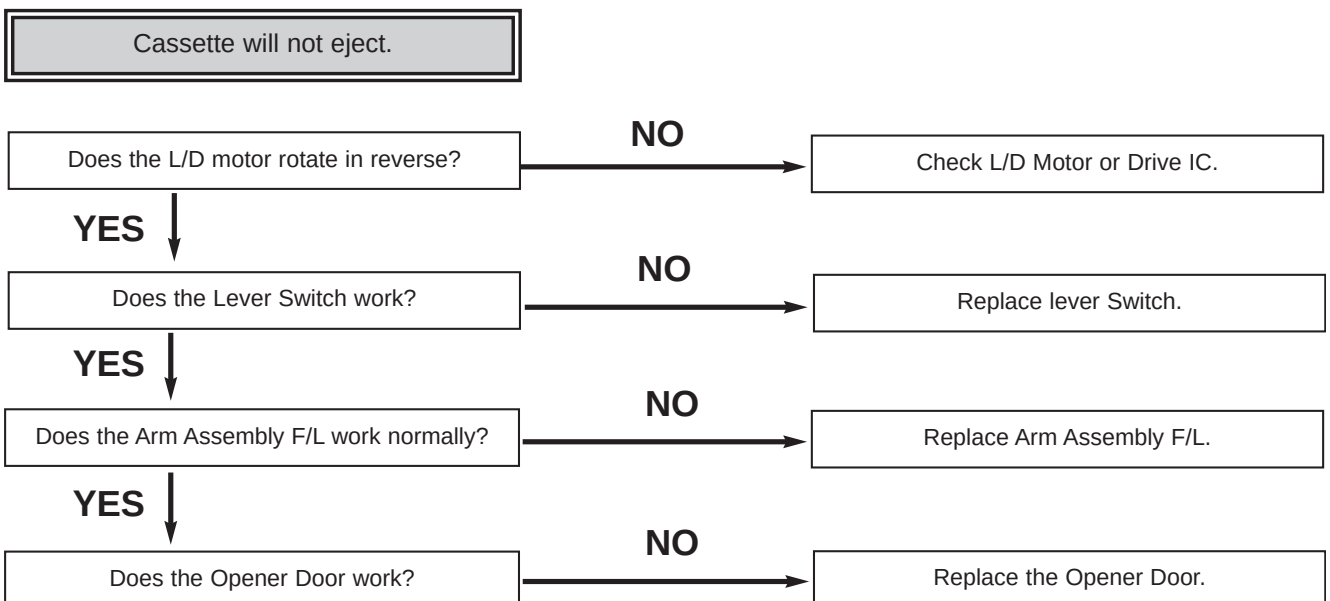
MECHANISM TROUBLESHOOTING GUIDE

2. Front Loading Mechanism

A.

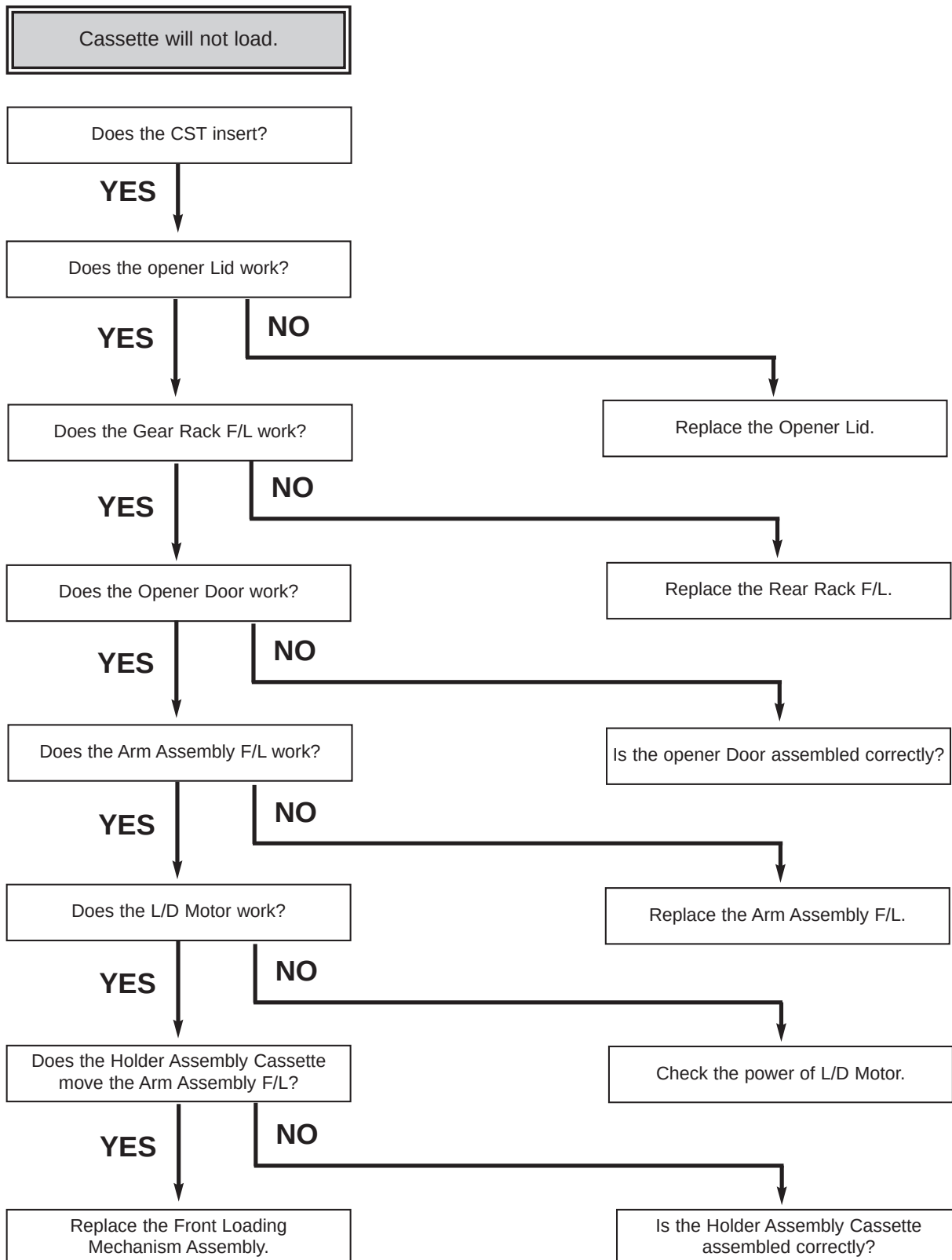


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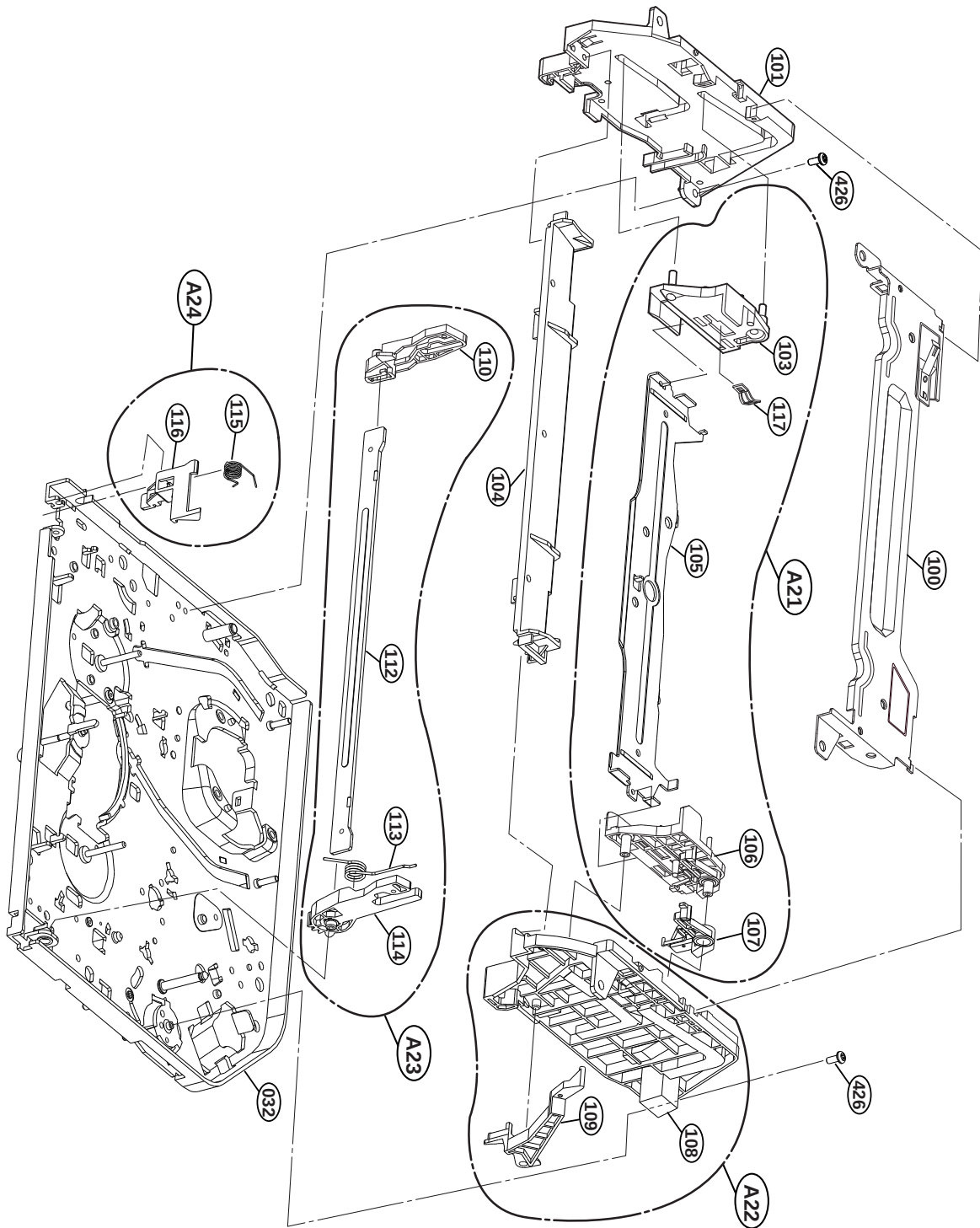
MECHANISM TROUBLESHOOTING GUIDE

C.



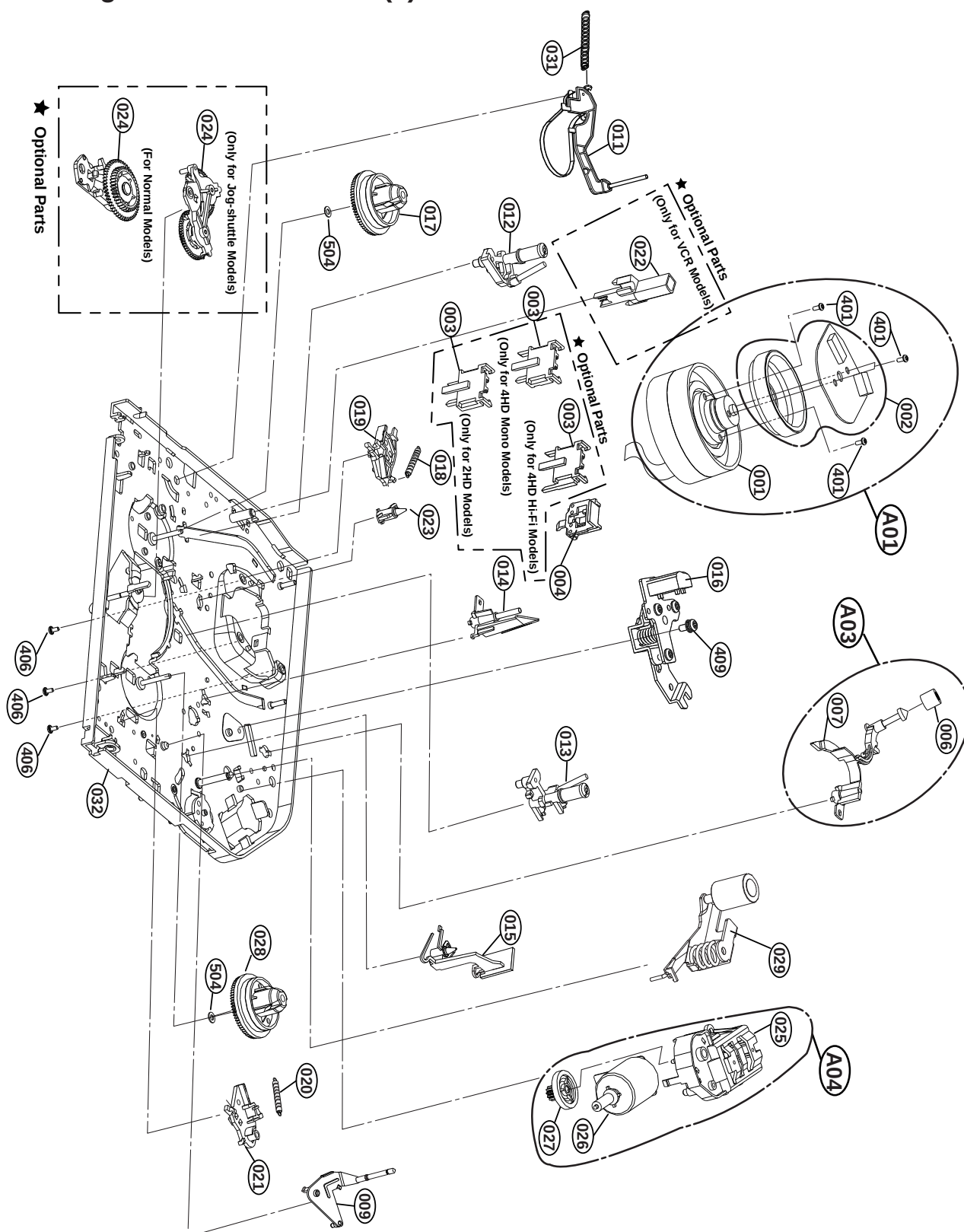
EXPLODED VIEWS

1. Front Loading Mechanism Section



EXPLODED VIEWS

2. Moving Mechanism Section(1)



EXPLODED VIEWS

3. Moving Mechanism Section(2)

